

MOTOR AGE

Vol. XXX
No. 13

CHICAGO, SEPTEMBER 28, 1916

Ten cents a copy
Three dollars a year

When the Big Selling Season Is Over—Then What?

Think of this for a minute. Everyone, regardless of organization or car, has been able to sell all the cars this year he could get.

People are not always going to accept anything, just because they can get prompt delivery.

Then only *certain* cars are in demand.

Are you handling one of those "certain" cars or has your business grown only because of the great demand?

Permanency of position for any dealer is secured only by having a car for which, regardless of season, there is a steady demand.

The Hudson Super-Six is a car of that type.



HUDSON MOTOR CAR COMPANY
DETROIT, MICHIGAN

We do not advertise for dealers. The Hudson franchise is not so easily secured. We make few changes among our dealers. There are more than 1500 in the "Big Family." But we do wish to know every automobile merchant. Perhaps such an acquaintance would sometime result to our mutual advantage.

Cowl Board and Speedometer Combined—for Ford Cars

Here's a new Stewart Product for Ford Cars—a Cowl Board, beautifully finished in black enamel, with a Stewart Speedometer mounted in the center.

It adds a finish and a touch of distinction to the Ford dash.

And it holds the Speedometer in a position where it is easy to read.

And the price complete is only a trifle more than the single cost of the Speedometer.

Already selling fast in all parts of the country.

Cet in among the leaders.

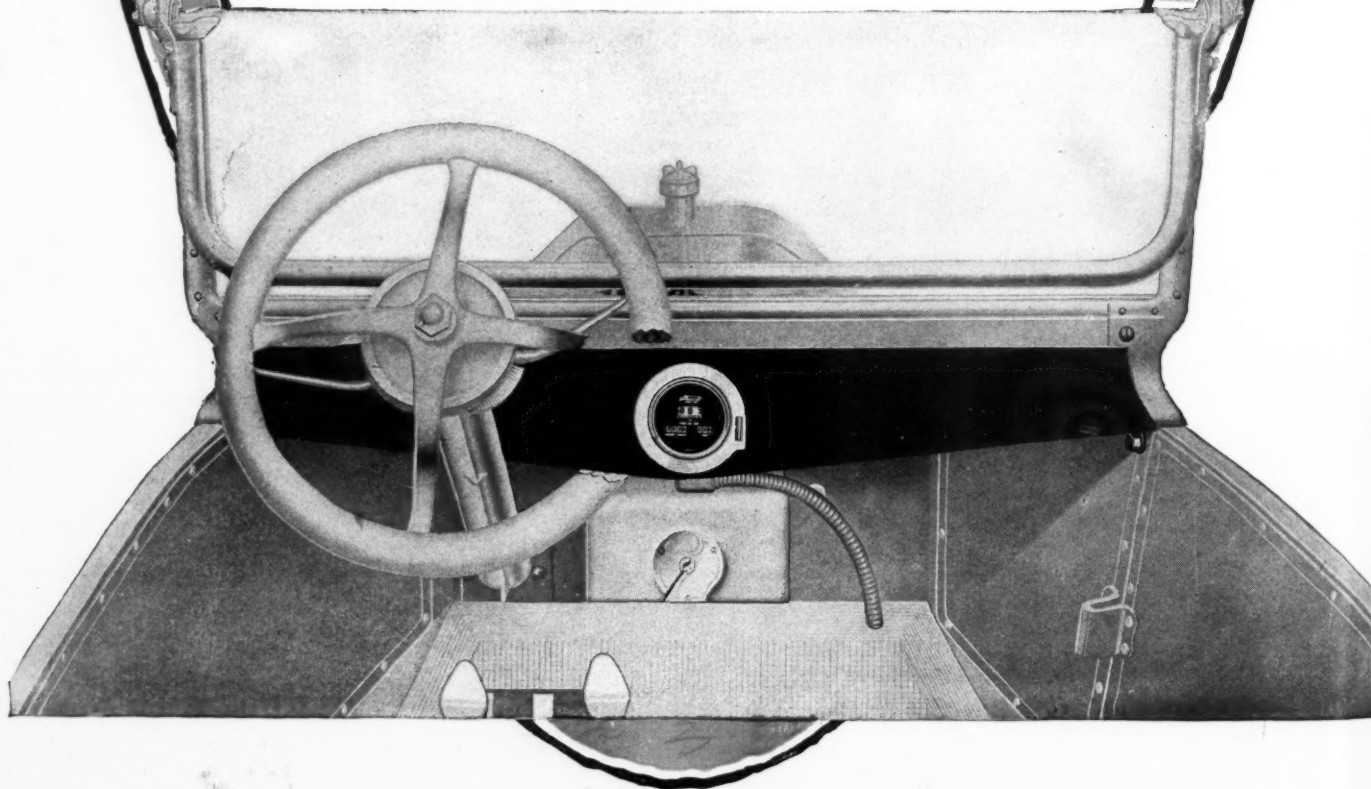
Speedometer for Fords, \$10
Cowl Board, \$1.25 Price Complete, \$11.25

*"It will pay you to see that the car you buy is equipped
with Stewart Products"*

The Stewart-Warner Speedometer Corporation
Chicago, Ill., U. S. A.

Stewart

Speedometer and Cowl Board for Fords





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ANNOUNCEMENTS

This week's issue starts Motor Age's campaign for uniform traffic laws. Read the text, study the charts and plans; then if any ideas come to you that appeal to you as improvements, write them down and mail them to Motor Age.

**MOTOR AGE, THE
AUTOMOBILE, AND
MOTOR WORLD not
only blanket the
Motor Car field at
home—but also ex-
ert considerable in-
fluence abroad.**

Those most influential in motoring affairs the world over read Class Journal publications. Every civilized country on the globe is represented on their subscription lists.

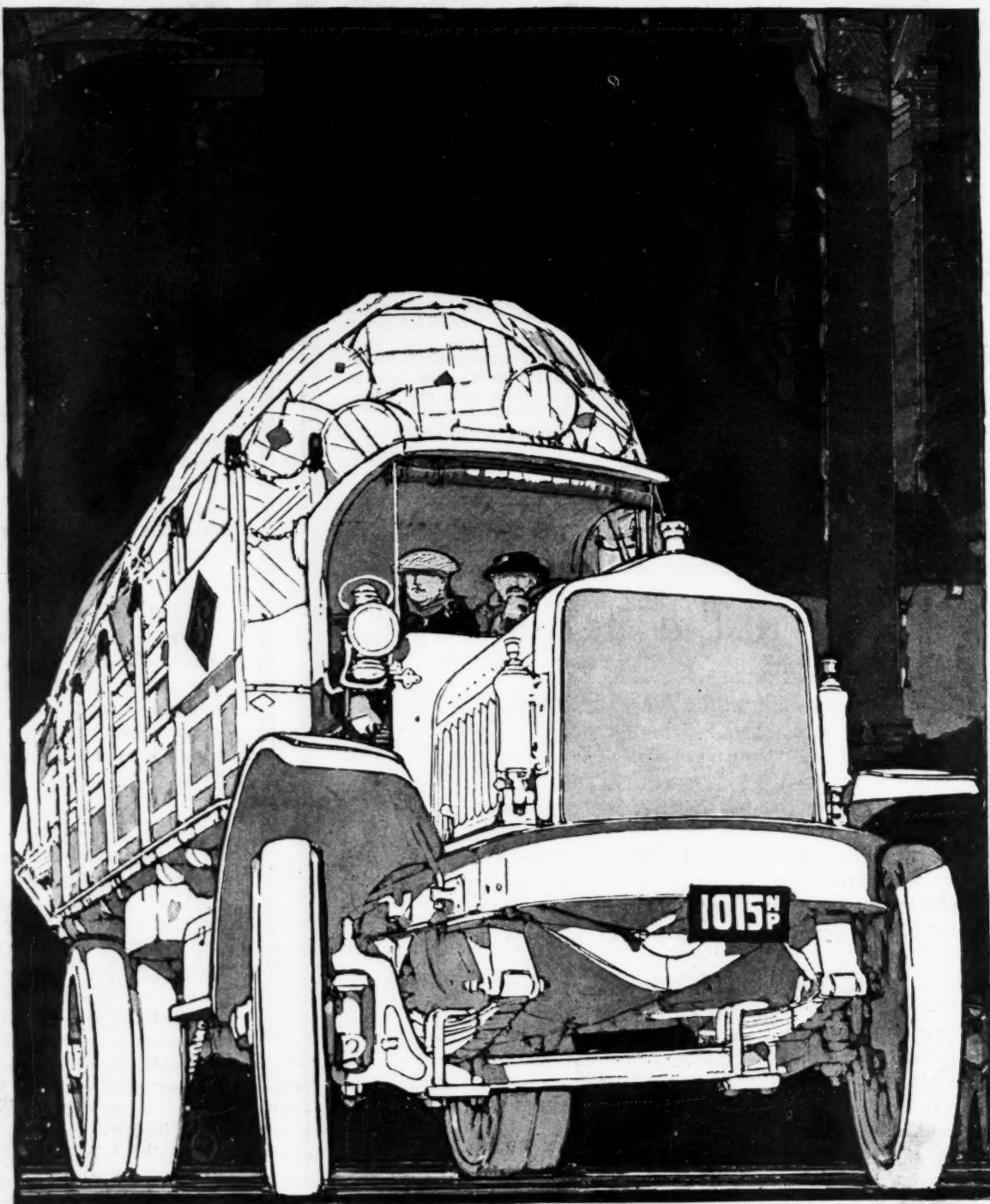
The following excerpt printed in Printers' Ink from an address delivered by C. A. Tupper at the Philadelphia Convention, A. A. C. of W., cites experiences not at all unusual to Class Journal Advertisers.

"In the commercial centers of Europe and other parts of the world the American automobile journals, such as MOTOR AGE, THE AUTOMOBILE and MOTOR WORLD, are circulated; I know of agencies abroad which have been solicited by responsible, active dealers as a result of the advertising carried in them. A Studebaker agency in Bangkok, Siam, and a Marmon agency in London, secured by this means, were called to my attention only recently."

Class Journal Publications have long arms. Hitch them onto your business.

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MOTOR WORLD
The AUTOMOBILE**

Western Offices
Mallers Bldg. Chicago



SCORES and scores of White Truck owners have driven their trucks a hundred thousand miles and more. We have letters on file from more than a hundred of these owners whose White Trucks now exceed that mileage and are still in excellent condition. (Facsimile copies of these letters will be mailed to anyone interested.)

So far mileage has been limited only by time and by the possibilities of trucking operation.



No White Truck has ever worn
out in commercial service

THE WHITE COMPANY
CLEVELAND

MOTOR AGE

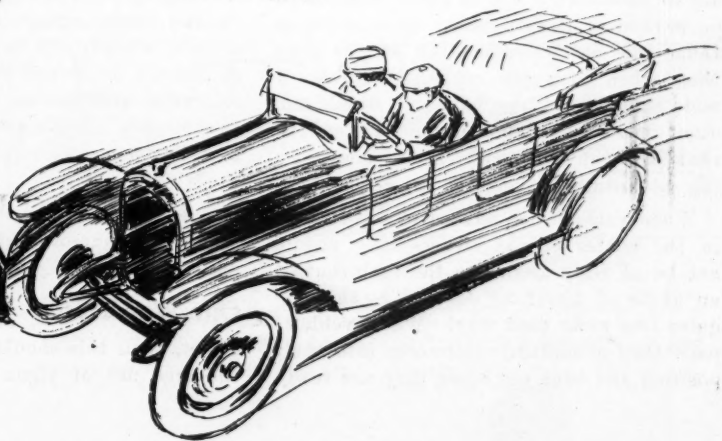
Standardizing Traffic Rules

By William K. Gibbs

THIS is the opening gun of the campaign for uniform traffic regulation which *Motor Age* begins in earnest with this issue. We have advanced the system formulated by William Phelps Eno as embodying the sane and constructive principles upon which a real model ordinance can be founded. This first of our traffic series is published with the purpose of bringing constructive criticisms and suggestions from motorists and others interested in uniform traffic regulation. We shall give the criticisms currency through the columns of *Motor Age* and are confident that from this exchange of ideas we shall be able to find the best foundation of unifying the traffic rules of the whole nation.

STANDARDIZED traffic regulation in all cities of 5,000 and over is just as essential as standardized time for the operation of railway trains. Were not all trains operating within certain parallels timed by synchronized chronometers one of the great aids towards railroad safety would be lost. Unless rules governing the movement and handling of motor car and all forms of vehicular traffic in cities are put on a standard time basis, so to speak, traffic congestion will continue to be a bugbear and the principles underlying Safety First will fail to serve their full purpose.

Motor Age does not go into the traffic problem to point out the defects in traffic regulations without offering a remedy. Hardly is it necessary to take up the defects, for there is no disputing the fact that the ordinances governing hundreds of cities need revamping. With systematizing play-



ing such an important part in present day progress it no longer is a question of what we have been in the habit of doing; rather, it is a search for the best method and that method once found, applying it to put the particular thing we are doing on the highest plane at the least expense, in the shortest time, and in the most useful manner.

No longer is the motorist confined to his immediate locality in which to do his driving. Good roads have broadened the territory in which he may drive. He may pass through a score of cities and towns in a day and if each has rules for governing his movement through their limits that are radically different he is confused and if he violates sections of an ordinance he is not to be blamed. Thus the need for uniformity of traffic regulations is evident.

We have made a study of a number of plans for handling traffic and have chosen the one advanced by William Phelps Eno as containing the fundamental principles on which we believe traffic in all cities of 5,000 or over can be handled to advantage. With an ordinance of this kind having so broad a scope, we can readily see how it can be made to harmonize with the peculiar conditions of any city and ultimately bring about the much-desired uniformity of traffic regulation.

William Phelps Eno, who divides his time between New York and Washington, has made an exhaustive study of traffic regulation, not for any pecuniary profit, but because he is interested in the elimination of street congestion and civic improvements that benefit the most people. His study has

covered a period of 16 or 17 years and his plan has been adopted largely by London, Paris, New York and other cities. He is working constantly for a standard system of regulation, not only in the United States but in European countries as well.

Street science is a term that is apropos in connection with the Eno plan. It is shorn of scientific terms and is not to be classed as an academic discussion with long tables of statistical data, which means that nothing is lost from its value.

Paris and London Use Ordinance

These regulations were officially adopted in Paris, July 10, 1912. Following this, London, where traffic was largely regulated by custom and usage, also codified similar regulations. Thus the police traffic regulations of three of the world's greatest cities are practically the same.

Before these regulations were introduced in New York nothing of the kind ever had been officially accepted, nor had even informal methods of regulating traffic been put into effect except in London and a few other British cities, where the drivers complied with the ancient and unwritten rules of the road and the special directions of well-trained police.

Study, with a view to progressive improvement should be encouraged, of course, but under no circumstances to the extent of allowing novices to disarrange and distort established regulations which have stood the test of international experience. The regulation of street traffic has grown to be an almost exact science and as such it is as important to know what to omit as what to include.

Traffic regulations are properly police regulations and should be adopted as such in their standard form in order to avoid division of authority and incompetent meddling. One ordinance, or other statute, empowering and making it the duty of the police department to regulate traffic is all that should be permitted. Most cities have some statute that gives authority. If they have not an adequate one the following form is recommended:

"The police department is hereby authorized, empowered and ordered to direct, control, restrict and regulate, and when necessary, temporarily to divert or exclude—in the interest of public safety, health and convenience—the movement of pedestrian, animal and vehicular traffic of every kind in streets, parks and on bridges, and to adopt and enforce regulations in regard thereto."

The regulations that follow have been revised by those who contributed to their compilation and also with the advice of others whose special training made their co-operation of value. In addition to this the experience of the police authorities and officials of drivers' syndicates, motor clubs and civic organizations of London and Paris proved advantageous.

They contain the basic principles of value generally in operation. Their development has been gradual and represents an extensive field of investigation, experience and analytical study.

TRAFFIC RULES MUST, ABOVE ALL, BE CLEAR AND CONCISE OR THEY WILL NOT BE READ; AND REASONABLE, ELSE THEY CANNOT BE ENFORCED.

What the Eno System Says About—

The term applies to waiting vehicles and to vehicles drawn up alongside of one another, not parallel to the curb. The term

Parking

PARKED is often misapplied to vehicles drawn up one behind the other in line. Vehicles when so placed are not parked, but **RANKED** as, for example, on a cab stand. When vehicles are parked, being parallel with each other, any one of them can move out without causing the other to move. When ranked they cannot do so unless considerable waste space is allowed between them. Where congested streets are of sufficient width to allow vehicles to be parked at the sidewalk, many more of them can be accommodated at the curb than when they are ranked. Streets, if wide enough, can also have cab stands and other waiting vehicles parked instead of ranked in the center, which, of course, is a big advantage in keeping the curbs clear.

When vehicles are parked at the curb or in the center of the streets they should not be at right angles to the curb, but at an angle of about 30 degrees as they require less room that way. When vehicles park they should drive directly into their position and back out when they are ready

to move on, as in this way drivers can watch for an opportunity to back out when they will not seriously retard traffic. If they do the opposite, that is pass the spot where they are going to park and back into it, they must retard any vehicles which are directly behind them.

Public parking spaces should be provided wherever there is any space room at places removed from the curb. These spaces should be designated by lines in or on the pavement and by signs and stanchions, and if to be used at night the signs should be lighted.

Stopping with the left side of a vehicle to the curb, except on one-way traffic streets, should not be allowed. Vehicles should not be parked within 10 feet of fire hydrants, and not so that other vehicles cannot stop at the entrance of buildings to take on or discharge passengers.

One-way traffic is not new. On streets that are too narrow for two vehicles to pass easily, its necessity is obvious. If traffic

One-Way Traffic

is to move only in one direction on a street, then this should be made plain by the free use of signs. Some streets are

sufficiently wide for two vehicles to pass when there is little if any congestion, while they become jammed when the busy hours come. These should be made one-way traffic streets during certain hours and signs used to show the hours when the one-way traffic is in force. Figs. 14 and 15 show the proper type of signs for exclusive and part-time one-way traffic streets. It is stupid and wasteful to have one-way traffic streets without signs. A sign costs about \$1.50, while a police officer at least twice that much daily. The economy is evident.

At circles where several streets converge a vehicle should pass around the circle, keeping to the right from entrance to exit.

Rotary Traffic

Fig. 2 shows the working of the rotary or gyratory traffic system at a point where several streets converge, but this plan will work equally well where two streets intersect, when there is enough turning space and almost automatically, with little or no police supervision. It is a no-stop system and tends to increase the traffic capacity of many streets 50 per cent or more.

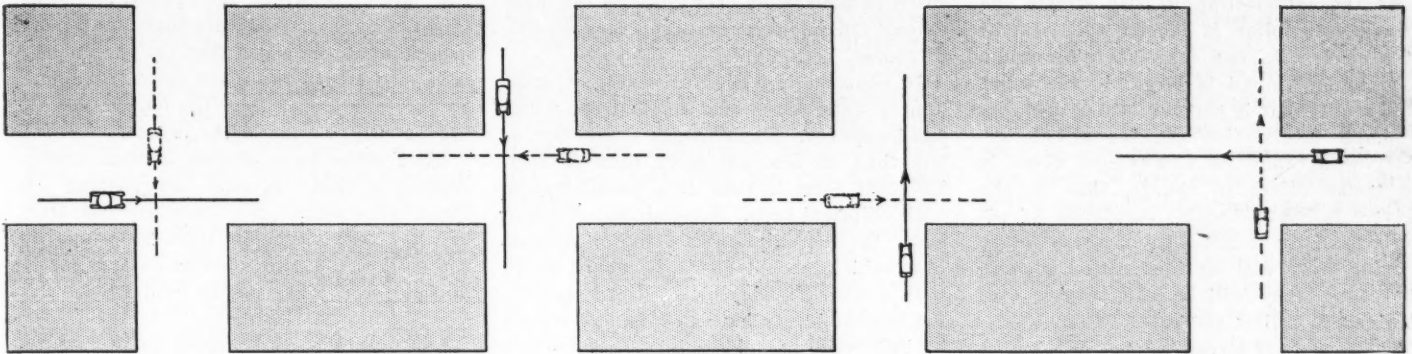


Fig. 1—It is the rule in many cities that when two vehicles approach a street intersection simultaneously, in the manner illustrated, the vehicle at the right, as indicated by the heavy lines, shall have the right of way, regardless of the direction it is traveling

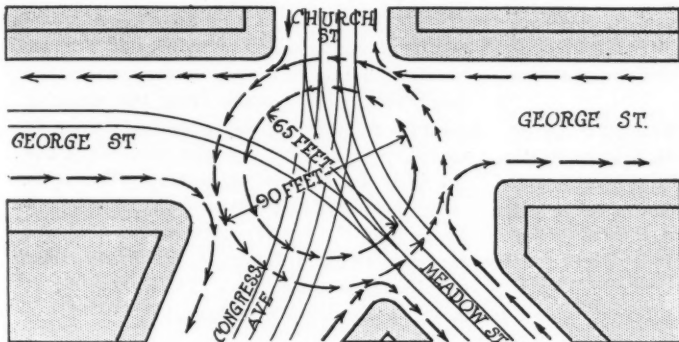


Fig. 2—The rotary system as used in New Haven, Conn. All vehicles move around circle in same direction. Note that all vehicles keep to the right at all times which materially lessens traffic congestion

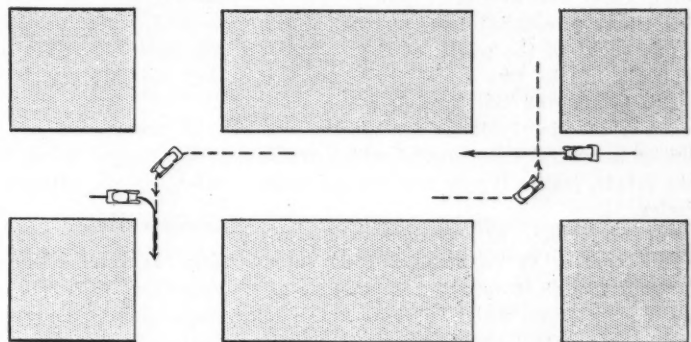


Fig. 3—If vehicle at right has the right of way, then, when one or more machines make a turn at a street intersection, they will be governed as shown, heavy lines indicating car to proceed

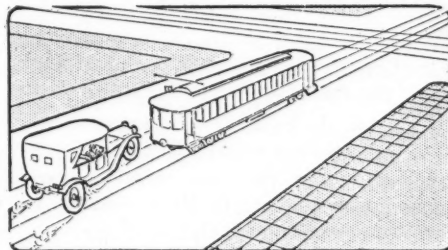
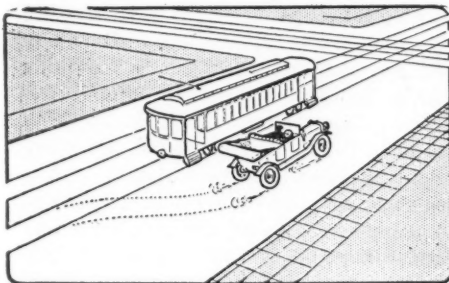


Fig. 9—Passing a street car at the left should be made a violation of the law. This method shown is responsible for many accidents that might easily be avoided

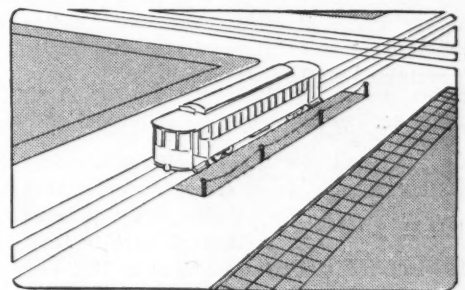


Fig. 10—Safety zones should be a little longer than the longest car to use them and they should be lighted at night

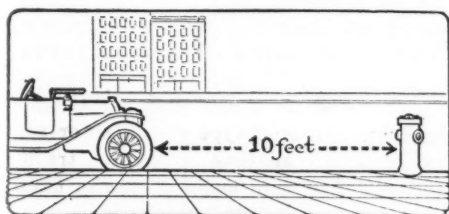


Fig. 8—The right way to pass street cars is indicated in this illustration

Fig. 11—Left—This indicates the distances that should be left clear at fire hydrants

Fig. 12—Right—The rotary system as used on San Francisco streets. Note traffic moves to the right

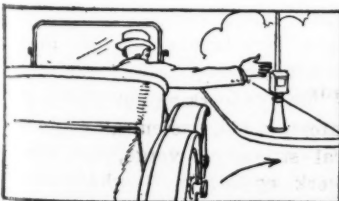
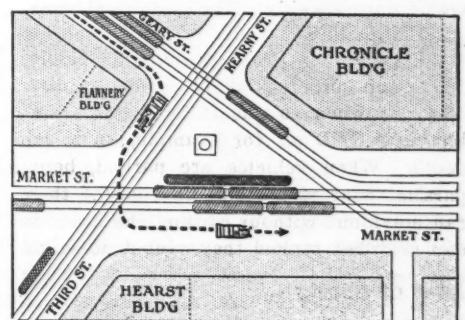


Fig. 4—When stopping, if the steering wheel is on the right-hand side, extend the arm horizontally. This signal also means you are going to turn a corner to the right. The arrows in this and also in Figs. 5, 6 and 7 point in the direction of turning. These are the signals in most general use

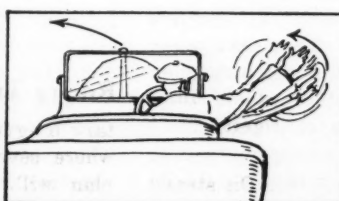


Fig. 5—If you have a right-hand drive car and you want to turn a corner to the left, extend the right arm as illustrated and swing it in a circle about 2 feet in diameter in the direction indicated by the arrow. Swing it slowly and perhaps not more than three or four times



Fig. 6—This signal is for a car with the steering wheel on the left side. The signal is to extend the left hand horizontally, which means either that you are going to stop or that you are going to turn a corner to the left. It is identical with signal No. 1, except that the other hand is used



Fig. 7—This signal is for a car with steering wheel on the left and the signal is intended for the case in which you are going to turn a corner to the right. The left hand, as illustrated, is also slowly swung in a circle 18 inches or 2 feet in diameter, two, three, four, or perhaps more, swings

At the intersection of two streets the principle to follow is exactly the same as at a circle. In one case, the obstruction zone to go around is large; in the other it is small; that is the only difference. At a simple intersection vehicles will do exactly what they do now where there is no traffic officer in charge, that is, the drivers follow the traffic regulation of going around the point of intersection before turning, only with an obstruction zone in the center they will be still further constrained to follow the rule.

The corners of streets are not usually cut back on a sufficiently large radius, especially for the rotary system of traffic, 6 feet being about the average. The proper radius where streets intersect at right angles is one equal to the width of the narrower sidewalk of the two streets. Where this radius is adopted the turning space often becomes sufficiently large for the installation of a central zone around which traffic may rotate, just as it now does around large circles.

For all streets of sufficient width the rotary system is recommended at intersections, though it may be necessary to use the block system, which is next explained, during congested hours where there are car tracks on one or both streets, but only local conditions will determine this. For acute angles the radius is greater and for obtuse angles it is less, the exact radius required at any intersection being easily ascertained mathematically.

The English block system consists in stopping and starting vehicles alternately at the intersection of streets in order that traffic may proceed through each in turn. It was introduced in New York in 1903 and its chief objection is that it halts traffic. Semaphores that enforce the block system over a number of squares at a time delay traffic unreasonably. The individual semaphore directs all traffic in sight, whereas the hand signal directs them individually. The block system is not recommended except possibly at the most important intersections.

Isles of safety serve two purposes. They make safe refuges for pedestrians in crossing crowded streets, relieving congestion of sidewalks. They also divide or canalize traffic and bring about vehicular order. Isles of safety have been successfully used for a half century in Europe. They have been adopted largely in South America. It is only in the United States that their adoption has been tardy, due to the fact that our people usually have to get all their experience first hand.

Permanent isles of safety should be raised in the roadway to the height of the sidewalk. They should be equipped with lamps and protection posts. Trial isles of safety can be made by painting the roadway and placing traffic stanchions on them where protection posts would be lo-

cated in permanent ones. Unless the stanchions are removed at night they should, of course, be lighted.

In constructing isles of safety it must first be determined how much street width can be spared. Their length should be not less than 15 feet nor more than 30 feet. The best form is that of a parallelogram with elliptical ends. Some cities use round ends, but the elliptical are better because if a vehicle should strike it would do so with a more glancing blow. Until recently the isles of safety have been placed nearly in line with the sidewalk. This reduces the radius of the turning spaces at the street intersection. It is better to place them with one end tangent to the inscribed circles as this leaves all the turning radius possible and puts them where they will not interfere with fire apparatus.

If crosswalks are marked and pedestrians taught to use them it will be vastly safer for all. Where blocks are short it is reasonable to require pedestrians to cross only at intersections, but if blocks are long there should be an intermediate crossing, plainly marked. Different colored paving is the best way, but painted lines are also good, although they wear away easily. It is feasible to treat asphalt so as to preserve a definite color, bright yellow being the most easily seen. Vitrified brick gives the dryest footing.

Many cities that paint lines for the crosswalk boundaries simply make them prolongations of the curb and building lines. This is wrong. They should be set back so that the boundary lines nearest the street intersections are tangents to a circle described within the four street corners, and the other boundary lines parallel to them are at sufficient distance to give reasonable width. One-half the average width of sidewalks of the two intersecting streets usually is sufficient for a crosswalk, though the width of the crosswalk should be modified according to circumstances. The diagrams in Figs. 23 and 24 show the correct and erroneous ways of marking crosswalks.

Safety zones differ from isles of safety in that the former consist of spaces parallel with car tracks where street car passengers may board or alight from cars and be protected from vehicular traffic that may be passing at the time the car is loading or unloading passengers.

Safety zones in the business districts have proven their worth. They are a great aid to persons boarding and alighting from street cars as they protect people from passing traffic. The use of these safety zones is not necessary throughout a city, but where traffic is heavy they should be used. If they are to be used at all they should be permanent, that is, 24 hours a day. Posts should be set in the pavement at intervals of 6 feet and each post should carry a light for use at night. Chains should be fastened to each post. The width of

the space between the posts and the street car need not be more than 4 or 6 feet, according to the space that the street permits. In length the space should be about 50 per cent longer than the longest car to use it. Fig. 10 shows the layout.

Most cities have clauses in their traffic ordinance that regulate the passing of street cars when passengers are boarding or alighting. Some of them have put in force very stupid regulations on this point, and uniformity is much to be desired.

Car operators in bringing their cars to a stop or in turning should signal other traffic so that there will be no uncertainty as to what they intend to do. A number of devices are now to be had for attaching to the rear and, in some cases the front also, that operate from the steering column and give a clear indication as to which way the turn is to be made or if the car is to be brought to a stop. For open cars the hand signals shown in Figs. 4 5, 6 and 7 are recommended. Closed cars present a different problem and they should carry some kind of rear signal, at least, in the interest of safety.

Increased use of semaphores is desirable. Some cities have not favored the semaphore and have given as their reason that

drivers of vehicles had become used to listening for the traffic officer's whistle and did not see the semaphore, especially where there are cars or other vehicles that hide it from the view of those immediately following. The semaphore should be high enough to be plainly seen and should carry a light at night. If the whistle signal is used then one blast should indicate passage of east and west traffic, and two, north and south.

Up to the present time traffic signs have been of all sizes and shapes, differently worded and of various colors, according to individual fancy, This is confusing and inefficient. All traffic signs should be uniform in shape and colors, and brief in wording. The first thing a traffic sign should convey is that it is a traffic sign and no other; the second, its special meaning by words or arrows.

Traffic Signs

Signs for warning and for directing the movement of traffic should have vivid yellow letters or arrows on a black background. These colors contrast strongly and show best of any in the day time and also when illuminated at night.

Signs for designating public parking spaces, cab stands, car and bus stops in cities, and those indicating distance and direction in the country should have the colors reversed, that is, the letters and arrows should be black and the background a vivid yellow. The combination of these colors in any signs except those already stated should be prohibited near the curb in city streets and on highways in the

country. Enameled iron signs are not satisfactory as they are easily broken. Cast iron signs with raised letters or arrows are best.

The use of Keep-Near-Curb signs is of great assistance in warning drivers to keep near the right-hand curb so as to allow room in the middle of the street for overtaking vehicles to pass on their left. The type of sign used in New York for this purpose is shown in Fig. 13 and similar ones have been installed in London.

General speed regulations should be national, but each state, city, town and vil-

lage, should have the right to limit locally the rate of speed and, when it elects to do so, it should erect a sign and light it at night. The one shown in Fig. 17 is different from other types and readily distinguished. The wavy line at the top indicates that speed must be reduced and the lower part tells the maximum rate allowed.

There is a growing feeling that signs of warning should be simplified and that perhaps one uniform sign of general caution is sufficient, for the simple reason that if warned against some special danger, one

is likely to look for that only and forget others. A sign with the word "slow"—even abbreviated to "slo" as shown in Fig. 16 would seem to be sufficient for most purposes and, having but three letters they could be large. The D danger sign, such as illustrated on the editorial page this week, is believed to be equally good.

If it is desirable to state the special reason for caution such as the proximity of a school or hospital, for example, which requires caution at certain hours the signs shown in Figs. 18 and 20 are sufficient for this purpose.

The Eno Traffic Ordinance

Italic Comment by Eno; Bold Face by Motor Age

Definitions

A—The term **STREET** shall apply to that part of a public highway intended for vehicles.

B—The term **ONE-WAY TRAFFIC** shall apply to a street when and where vehicular traffic is restricted to one direction.

C—The term **CURB** shall apply to the boundaries of a street.

D—The term **HORSE** shall apply to any draft animal or beast of burden.

E—The term **VEHICLE** shall apply to a horse and to any conveyance except a baby carriage.

F—The term **STREET CAR** shall apply to any conveyance confined to tracks.

G—The term **DRIVER** shall apply to the rider, driver or leader of a horse, to a person who pushes, draws, propels, operates, or who is in charge of a vehicle.

H—The term **PARKED** shall apply to a waiting vehicle and to waiting vehicles drawn up alongside of one another, not parallel with the curb.

Duties of Drivers and Pedestrians

A—Streets are primarily intended for vehicles, but drivers must exercise all possible care not to injure pedestrians.

B—Pedestrians should, first, avoid interference with vehicular traffic and to this end not step from the sidewalk without first looking to see what is approaching; second, cross street at right angle, preferably at a crosswalk and, where a traffic policeman is stationed wait for his signal; third, stand on the sidewalk or close to the car tracks when waiting for a car; fourth, face the front of the car when alighting and observe the traffic on the right before moving to the sidewalk, and, if passing behind a car, observe traffic in both directions.

C—Pedestrians should keep to the right and not stop so as to obstruct a sidewalk or crosswalk on an entrance to a building.

D—Pedestrians on streets with narrow sidewalks should use the sidewalk on their right.

The following regulations for vehicles shall be observed by the drivers thereof, WHO SHALL ALSO COMPLY AT ALL TIMES WITH ANY DIRECTION BY VOICE, HAND OR WHISTLE FROM ANY MEMBER OF THE POLICE FORCE AS TO STARTING, STOPPING, SLOWING, APPROACHING OR DEPARTING FROM ANY PLACE, the manner of taking up or setting down passengers, and the unloading or loading of anything.

Police officers may temporarily divert traffic to avoid congestion.

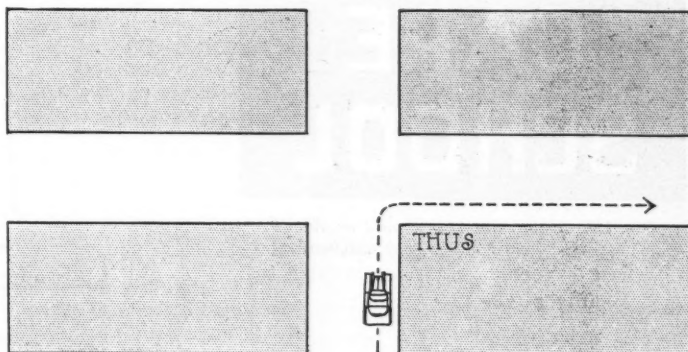
ARTICLE 1—Passing, Turning, Keeping to the Right, Backing and Following.

Section 1—A vehicle meeting another shall pass to the right.

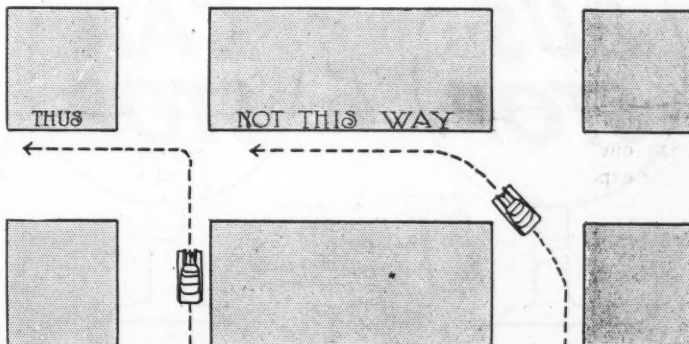
Section 2—A vehicle overtaking another shall pass to the left and not pull over to the right until entirely clear of it, except in overtaking a street car when it shall pass to the right if space permits.

Note—In some cities this regulation has been written so as to prohibit vehicles passing to the left of a street car under any circumstances. If this were carried out to the letter in any large city the waste of time entailed would be prohibitive. No traffic regulation should be more drastic than is absolutely necessary to insure reasonable safety.

Section 3—A vehicle turning into a street to the right shall turn the corner as near the right-hand curb as practicable.



Section 4—A vehicle turning into a street to the left shall pass around the point of intersection of the two streets, but if so directed by the traffic officer shall pass in front instead of around the point of intersection.



**SLOW MOVING VEHICLES
KEEP NEAR RIGHT-HAND CURB.**

RULES FOR DRIVING CAN BE OBTAINED AT ALL POLICE STATIONS

Fig. 13—This is the type of sign used in New York to warn slow-moving vehicles to keep to the right

Fig. 17—Right—The wavy line warns drivers to slow down, and the figures show speed allowed



Fig. 16—This abbreviation of the word "slow" is sufficient warning, and having but three letters, they can be made larger



Fig. 19—This type of sign should be used to denote spaces set aside for public parking, and the sign should be lighted at night

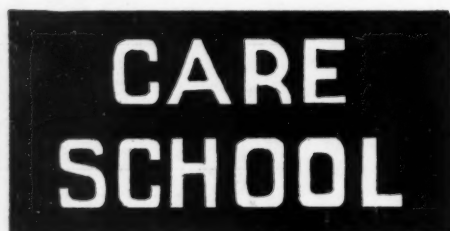


Fig. 18—A sign like this should be placed on all streets leading past a school



Fig. 14—Type of sign recommended for exclusive one-way traffic



Fig. 15—Type of sign to be used where traffic moves one way only during certain hours of the day



Fig. 20—A sign of this kind should be placed on streets leading to hospitals



Fig. 21—Left—Proper sign to denote cab or bus stops

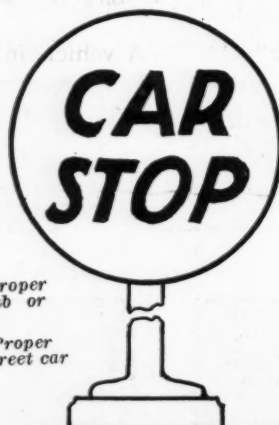


Fig. 22—Right—Proper sign to denote street car stops

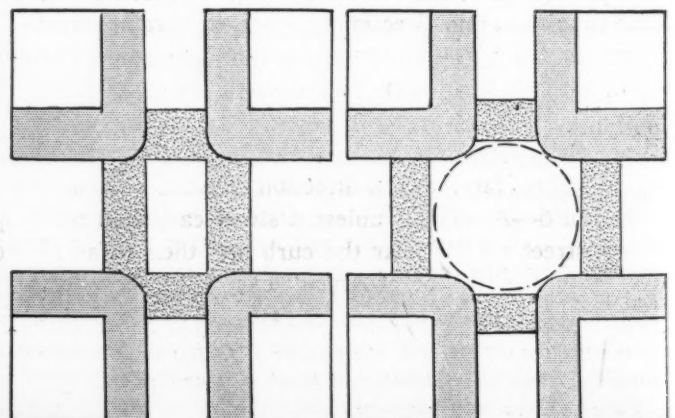
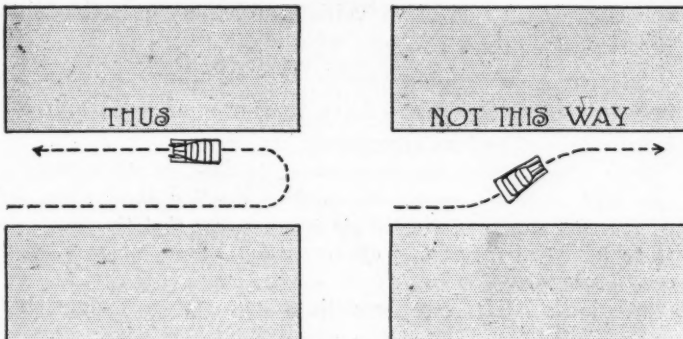


Fig. 23—Below, left—The wrong method of marking out crosswalks. This is a prolongation of the building and curb lines. Too many cities make walks this way

Fig. 24—Below, right—The right way to lay out crosswalks. The sides of the crosswalks should just touch the circle described by touching the four corners

Note—Occasionally vehicles cannot make the turn around the point of intersection without backing, and therefore the last clause of the previous section should be incorporated in the ordinance. THE REASON FOR NOT LEAVING THIS OPTIONAL WITH THE DRIVER IS ON ACCOUNT OF THE DANGER TO PEDESTRIANS AND TO OTHER VEHICLES which would be greatly increased because unexpected.

Section 5—A vehicle turning from one side of the street to the other shall do so:



Section 6—A vehicle shall keep as near as practicable to the right hand curb so as to leave the center of the street clear for overtaking traffic—the slower the speed the nearer the curb.

Section 7—A vehicle on a street divided longitudinally by a parkway, walk, sunken way, viaduct, isle of safety, or cab stand, shall keep to the right of such division.

Section 8—A vehicle passing around a circle shall keep to the right from entrance to exit.

Section 9—A vehicle shall not back to make a turn if it obstruct traffic, but go around the block or to a street wide and clear enough for the purpose.

Section 10—A vehicle shall not follow another too closely for safety.

ARTICLE II—Stopping, Standing and Parking.

Section 1—A vehicle shall not stop with its left side to the curb except in a one-way traffic street.

Section 2—A vehicle waiting in front of an entrance to a building shall promptly give way to a vehicle arriving to take up or set down passengers.

Section 3—A vehicle shall not be left in such a position as to prevent another from coming to the curb in front of an entrance to a building, nor so as to prevent another already stopped at the curb from moving away, nor within 10 feet of a fire hydrant.

Section 4—A vehicle shall not stand so as to prevent the free passage of other vehicles in both directions at the same time or in one direction in a one-way traffic street.

Section 5—A vehicle, except where parking is allowed, shall not stand at any angle backed up or head on to a curb, except while actually loading or unloading, and if horse-drawn and with four wheels the horses shall stand parallel with the curb, faced in the direction traffic is moving.

Section 6—A vehicle, unless a street car, shall not stop in any street except near the curb and then so as not to obstruct a crossing or crosswalk except to allow another vehicle or pedestrian to cross its path.

Section 7—A street car shall not stop within an intersection of streets nor within 5 feet of a street car ahead, not so as to obstruct a crosswalk.

Note—The sections of this article have been formulated with a view to restricting waiting and parked vehicles, so that, while no necessary hardship is imposed, the rights of all are conserved. The practice of many cities of permitting vehicles to stop an specified streets for a prescribed number of minutes fails to solve the problem, but the application of the sections of this article relieves the situation the fullest possible measure. It is much better to have the driver of a vehicle, which he desired to leave unattended, take it to some place alongside a park, an unoccupied building, or to any place not too close to the entrance of an unoccupied building, or even to a garage, rather than obstruct the public street.

ARTICLE III—Overtaking Street Cars.

Section 1—A vehicle overtaking a street car stopped to take up or set down passengers shall slow down, proceed with great caution and consideration and not approach or pass within 5 feet of the step of the car while it is so stopped.

Note—This regulation was first put into effect in New York in 1908 and read as follows: "A driver of a vehicle overtaking a street car shall exercise due caution not to interfere with or injure passengers getting on or off."

The present New York regulation reads: "A vehicle in overtaking or meeting a street car, which has been stopped for the purpose of receiving or discharging passengers, shall not pass or approach within 8 feet of such car so long as such car is so stopped." This is one of the worst examples of an attempt by inexperienced persons in formulating traffic rules. There is no adequate reason why a vehicle should not pass or approach within 8 feet of a stopped car.

If safety zones are provided there is no reason why vehicular traffic cannot proceed past a car that has stopped to take on or discharge passengers, and where the street width permits, even though there are no safety zones, it often is unnecessary to make the movement of traffic under the conditions so rigid. In a measure the rule requiring cars to stop a certain distance back of a stopped street car makes the situation more hazardous, because it tempts the drivers to speed up just before a street car comes to a stop and at a time when the street car obstructs their view of vehicles coming through the cross street.

ARTICLE IV—Right of Way.

Section 1—When in the performance of duty, the following vehicles shall have the right of way: U. S. Mail, Police, Fire, Fire Patrol, Bureau of Buildings, Emergency Repair of Public Service Corporations, Ambulances and the Military.

Section 2—Conditions warranting, north and south traffic should have the right of way.

Note—Some cities approve of the plan of giving the right of way to traffic approaching from the right. For example, if two cars are approaching an intersection where there is no traffic officer to direct which shall have the right of way, the driver of the vehicle who finds the other vehicle crossing his path from the right gives the other vehicle the privilege of passing in front of him.

Section 3—A vehicle in front of a street car shall turn out immediately upon signal.

Section 4—A vehicle shall not so occupy any street as to obstruct traffic.

Section 5—A vehicle, on the approach of fire apparatus, shall stop so as not to interfere with its passage.

ARTICLE V—Signals.

Section 1—A vehicle's driver when slowing or stopping shall give timely signal by hand or whip, or in some other unmistakable manner.

Section 2—A vehicle's driver when about to turn either from a standstill or while in motion, shall give timely sig-

nal by hand or whip or in some other unmistakable manner to indicate the direction of the turn. *This is especially important when turning to the left.*

Note—Holding the hand straight out from the driver's position is an indication that a turn is to be made toward the side nearest the driver. Circling the hand in either direction indicates a turn toward the opposite side from which the driver is sitting. Closed cars present another question and it seems probable that mechanical signals of some description are necessary where the driver's compartment is entirely closed.

Section 3—A vehicle before backing shall give ample warning.

Section 4—Police whistle signals shall indicate:

One blast—North and south traffic stops and east and west traffic proceeds.

Two blasts—East and west traffic stops and north and south proceeds.

Three or more blasts—Approach of fire apparatus or other danger.

Note—There is at present a reversal of the first two signals in some cities, which is confusing to motorists outside of the particular city where the reversal is in effect.

Section 5—A vehicle shall be equipped with lights and sound signals as prescribed by law.

Note—This gives considerable latitude as to what sound signals shall be approved by each municipality. The same is equally true with reference to lights. Dimming laws have been put into effect in many cities and are more or less rigidly enforced. Nevertheless it is confusing to have different laws governing different cities and the need for uniformity is as evident in this regard as in other parts of traffic ordinances.

Section 6—Sound signals are prohibited except for necessary warning.

ARTICLE VI—Speed

Section 1—A vehicle shall not exceed the rate of speed established by law and shall proceed with great caution, especially in making turns, in crossing other streets and crosswalks and in passing other vehicles.

Section 2—A vehicle shall not cross a sidewalk to or from an alley, lot or building, except very slowly and with great caution.

ARTICLE VII—Restrictions in Regard to Vehicles

Section 1—A vehicle's use is prohibited when so constructed, inclosed, equipped or loaded as to be dangerous, retard traffic, or prevent the driver from having a view sufficient for safety.

All policemen should be made to understand that they have general traffic obligations. To make this clear to them the following order is recommended:

"You are hereby informed that it is the duty of every policeman to correct and instruct drivers in the traffic regulations and reprimand them for infractions thereof, and if an offense is committed with intent to block traffic or to interfere with the rights or safety of others, to take the driver's name, number and address, the vehicle number, if it has one, and such other particulars as may be available for identification and report same to his precinct for action. In case of a serious intentional offense, the driver should forthwith be arrested."

Neglect to issue and enforce this order in New York, for example, is inexcusable, and is resulting in chaos, especially uptown. Except in streets where there are traffic policemen there is little or no enforcement of the regulations today and conditions are not improving.

Police officials should be required to carry a standard accident card in order to safeguard the taking of all details that have a bearing on the accident in question. In the rush of interviewing several persons immediately after an accident some vital point may be overlooked unless a standard form of accident report is used.

The Eno system does not attempt to regulate headlights, yet this is a problem

Section 2—A vehicle's use is prohibited when so loaded with iron or other material as to create loud noises while in transit.

Section 3—A vehicle, when loaded with any material extending beyond its rear shall be provided with a red flag by day and a red light by night on the extreme rear end of such load.

Section 4—A vehicle, unless confined to tracks, shall not tow more than one other vehicle and the connection shall not be longer than 16 feet.

Section 5—A motor vehicle left standing, without the operator in charge, shall have its motor stopped and efficiently locked and its emergency brake set.

Note—This section has been added because of the stealing of cars and accidents caused by children starting them when left without the operator. By locking is not meant that the wheels are to be locked so that traffic officers cannot move the car if it becomes necessary.

Section 6—No one less than 16 years of age shall drive a vehicle intended for commercial purposes.

Section 7—No one shall ride upon the rear of a vehicle without the driver's consent, not with any part of his body protruding.

Section 8—Coasting is prohibited when dangerous.

Section 9—The use of a motor muffler cutout is prohibited.

Section 10—Dense smoke from motors is prohibited.

ARTICLE VIII—Control. Treatment and Condition of Horses.

Section 1—A horse shall not be unbridled, not left untended in a street or uninclosed space without being securely fastened, unless harnessed to a vehicle with wheels so secured as to prevent its being dragged faster than a walk.

Section 2—A driver shall continuously hold the reins in his hands while riding, driving, or leading a horse.

Section 3—No one shall overload, over-drive, over-ride, ill-treat or unnecessarily whip any horse.

Section 4—No one shall crack or use a whip as to excite any horse other than that which he is using, or so as to annoy, interfere or endanger any person.

Section 5—No one shall use a horse unless it is fit for its work, free from lameness and sores likely to cause pain, and from any vice or disease to cause accident, injury or infection.

that needs standardization and Motor Age will consider this in the traffic series. WE WANT SUGGESTIONS FROM MOTORISTS AND OTHERS INTERESTED, WITH A VIEW TOWARD BRINGING ABOUT UNIFORMITY. STANDARDIZATION OF HEADLIGHT ORDINANCES IS IMPERATIVE!

This concludes the first of the traffic series. Motor Age does not advance this method as being the BEST AND ONLY method of solving traffic regulation. It solicits constructive criticism and believes that out of this exchange of opinion will come, ultimately, such information as will make the drafting of an ordinance that safely can be used as a standard.

Hudson Nearly Repeats

**Return Trip Across Continent
Made in 5 Days, 17 Hours,
32 Minutes.**

**Slightly Slower Time Going Back;
Mulford and Patterson Drive.**

SAN FRANCISCO, Sept. 25—Special telegram—From San Francisco to New York and back to San Francisco in 10 days 21 hours 3 minutes is the remarkable run made by the Hudson supersix seven-passenger touring model which started on its record attempt September 13 and reached its goal Sunday, September 24. Alternating in driving the car were A. H. Patterson, Ralph Mulford and C. H. Vincent, the trio which on the way to New York established a new coast-to-coast record of 5 days 3 hours 31 minutes. The return trip was slower, taking 5 days 17 hours 32 minutes, but still better than any previous record except its Pacific-Atlantic time. Had it not been for heavy rains during the last 600 miles back to San Francisco which rendered the roads very slippery and fast traveling through the Sierra Nevada mountains dangerous, this last leg of the run probably would have been made in 15 hours less. It required 35 hours as against 20 on way to the east. Just before reaching Elco, Nev., the Hudson party was still 1½ hours ahead of its schedule.

The total distance covered by the Hudson was nearly 7,000 miles for the double cross-country run and the daily average was about 700 miles, including all stops. Considering that only a little over a year ago the best time made, to drive from coast to coast one way only, was 11 days 7 hours 15 minutes, it can be seen that the new mark established by the Hudson for its double coast-to-coast run in less time than the former one-way record is a noteworthy event and the best evidence of the great strides made during the past year.

ALL-YEAR CAR SHOW WEEK

Hartford, Wis., Sept. 25—Kissel dealers throughout the country are making a special showing this week of Kissel All-Year cars. Special displays and decorations in the show rooms are the rule and special demonstration features have been arranged in thirty of the leading cities.

TO INVESTIGATE SAFETY DEVICES

New York, Sept. 26—Special telegram—The Safety First Federation of America has appointed a Bureau of Standards which will investigate the merits of safety devices which may be submitted to it. The recommendations of the bureau after its investigation of the device has been completed, will be submitted to the directors of the federation for approval and such

devices as come up to the standard of the federation will be endorsed.

Darwin P. Kingsley, president of the New York Life Insurance Co., has been made chairman of the bureau and associated with him are Ernest P. Goodrich, E. E. Rittenhouse, Charles Bernheimer, William Guerin, George H. Robertson, Joseph Tracy and William Bondy. Wayne D. Heytecker has been appointed executive secretary of the association succeeding Frederick H. Elliott, resigned.

UNITED AMERICA CAR AT DES MOINES

Des Moines, Ia., Sept. 26—Special telegram—The Hupmobile capital-to-capital tour car, which is visiting the capitals of every state in the union, reached its nineteenth state today at Des Moines. During the last week the capitals of Michigan, Indiana, Illinois and Wisconsin were visited. At Madison, Wis., the Hupmobile had completed 3,633 miles of its 20,000-mile journey.

ROAMER PRICE INCREASED

Streator, Ill., Sept. 26—The Barley Motor Car Co. has increased the price of the Roamer car \$50, making the new price \$1,850.

SWEET LEAVES M. & A. M.

New York, Sept. 25—William E. Sweet, for 10 years general manager of the Motor & Accessory Manufacturers, the national organ of the accessory industry, has resigned to become assistant to the president of the United Motors Corp., New York. This organization is a holding company recently formed and its subsidiaries are Delco, Hyatt, New Departure, Remy, Klaxon and Perlman. Mr. Sweet assumes his new position on October 15. He will have the management of the corporation under the direction of the president and board of directors.

SAYS BRITISH TANKS ARE TRIPLETS

Minneapolis, Minn., Sept. 25—Further details of the construction of the British armored cars known as tanks and which are being used so effectively by the allies in their drive on the Somme are offered by Victor R. Hansen, of this city, who claims to have invented the application of the caterpillar principle to the tractors utilized in the fighting. Hansen says the machine is mounted on three caterpillar tractors, the head one being the unit of propulsion and the other two supporting the body. The machine is 28 feet long, 16 feet high and 16 feet wide, according to Hansen, and it has a conical body and either steam or gas power may be applied. Hansen claims to have begun action to protect his interests and exhibits a contract with a colonel in the British army for the use of the patent.

From another source it is understood that Robert W. Gottshall, representing the Holt Caterpillar Tractor Co. in London, is said to have adapted the caterpillar for its use on the European front.

New Goodyear Sale Plan

**Will Reduce Number of Dealers
About 66 Per Cent on
October 1.**

**Dealer Must Operate Service Station
Under New Rule.**

NEW YORK, Sept. 26—Special telegram—The Goodyear Tire and Rubber Co. will put into effect October 1 a new plan for the retailing of its tires. The number of dealers will be reduced about 66 per cent and those that remain will be required to be of a high grade from a business standpoint. All price lists will be withdrawn October 1 and the new plan will be instituted at once. Dealers, under the new system, must have service stations as well. They must carry an adequate stock of tires, tubes and accessories and must be in position to give to the public the service to which Goodyear considers the public is entitled.

There will be no change of consequence in price. Tires will be sold, as heretofore, on the consumer's list while the dealer's price will be based upon what has become known as the pink list. No requirements as to price maintenance will be made.

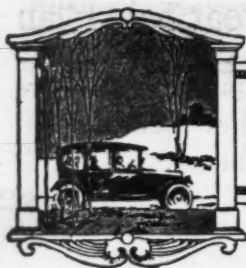
It is estimated that there are now in the United States 25,000 or 30,000 Goodyear dealers, and it is also estimated that under the new plan there will be only about 10,000. The plan has been operating partially in Chicago, Kansas City, St. Louis, Boston and New York for several weeks.

The present list has not yet been withdrawn in these cities, but the placing of service dealers has been begun. While the Goodyear move is radical among large tire producers, it is not entirely new with Goodyear, for its cord tire has been handled on this basis. Because the cord tire was a new type and a comparatively expensive article, it was required that the dealer maintain certain stock and be equipped to take care of his trade.

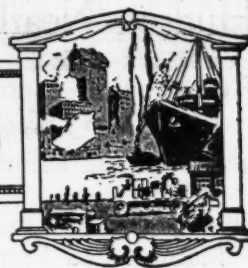
The new contracts with dealers will not give exclusive territory, although one of the company's executives states that in towns of a reasonably small population there might not be more than a single dealer, still he would not be given an exclusive territory, the company reserving the right to sell there if it should choose. In fact, one dealer might be placed next door to another.

SPEEDWAY FOR PITTSBURGH

Pittsburgh, Pa., Sept. 25—The Pittsburgh Speedway Association has closed a deal for 600 acres of land, and work will begin shortly on a motor speedway estimated to cost \$1,000,000. The track is to be 2 miles in circumference and present plans include an inner track for horse racing.



EDITORIAL PERSPECTIVES



The D Danger Sign

STANDARDIZED road signs for motorists are needed as a safety measure to guard against accidents and make the highway safer. It is particularly necessary that we have some uniform type or standardized danger sign marking dangerous curves, dangerous railway crossings, dangerous cross roads, dangerous bridges and other dangerous road conditions.

A SUGGESTED standard form of danger sign for a positively dangerous turn, or bridge or railroad crossing would be a large circle painted black and white with the letter D showing prominently in center.

WE select the circle because it is the most potential form of sign. It appeals more to the eye than the square or the diamond or the triangle.

WE urge to have it painted black and white because they form an excellent color combination for daylight and by far the best contrast for night use. Red may be a better color by day but it shows black by night. Black and white are the best colors for the dark. Witness the black and white gates on the Long Island railroad as contrasted with the all black gates. You see the black and white, or barber sign gates, for some distance. They are a real safety. Often the black gates are a peril.

WE are opposed to the words "Stop," "Danger," or "Go Slow" as signs at danger points. The circular sign with the letter D is preferable. You see it more quickly. The eye catches it with less effort. The brain translates it with less effort.

Using the D Sign

THE D danger sign, if the phrase may be coined, should only be used where real danger exists. It should be used on curves that cannot possibly be taken at the speed of the road previous to the curve. Suppose you are traveling at 35 miles per hour and there is a hidden curve that cannot be taken at 20 miles per hour. The D danger sign is needed at such a point.

A GAIN: There is a bridge with a sharp curve leading on to it, a curve that you cannot make with safety at 20 miles per hour. The curve may be hidden. Place a D danger sign at such a point.

FURTHER: There is a hidden railroad crossing; or if not hidden then one with a bad curve that cannot be seen until you are nearly on it. Here the D danger sign is needed. Place the sign a good distance back so that the driver has a chance to slow down without having to apply the brakes too severely. Too often danger signs are placed too close to the danger. You should have them 100 yards away from the danger, perhaps 200 yards, depending on whether the road is such that you will be approaching at speed or not.



THESE D danger signs must not be abused by being placed at points where there is not a danger factor. Often you see a huge sign, "Danger-Stop," or, "Danger-Slow," and you slow down to 20 miles per hour only to find that there is no real danger and deep down in your heart you feel that the use of the sign has been abused. The danger sign has been used where there is really no danger.

FOR such cases use an S slow sign. The S slow sign might be a smaller circle in black and white with the letter S in the middle. The S slow sign would mean slow down to 25 miles per hour. The danger factor would not be so great as where the D danger sign is used. The S slow sign would mean that you should get your car under 30 miles per hour and as low as 25 miles per hour; in other words have your car well under control.

THESE two safety signs, the D danger and the S slow could readily be standardized in every state in the union. Such a standardized sign is needed.

MOTOR AGE invites its readers to co-operate in this work of standardizing at least two such signs, one for real danger and the other to slow down. If you have better ideas than we have suggested send them in. We want them. If you have a scheme to get a movement under way in the town or city where you live to get such sign adopted tell us of it. At least do not rest until you have done something to further the standardizing of road signs. Your safety and the safety of every other motorist should urge you in such work.

The Baggage Pocket

LET us have more small baggage compartments in the car provided with lock and key so that you can feel entirely safe leaving your goggles, Blue Book, gloves and other small articles in the car overnight when traveling through a new country and stopping at strange garages. Instead of one small compartment with lock and key we might have three or four. It is economy to have one for some small tools. In a summer's travel you lose enough air pressure gauges for your tires to pay for a few of such compartments. Each gauge you buy costs \$1 unless you are fortunate enough to get a trade discount. Goggles disappear with amazing regularity. You do not dare leave your Blue Book in the car.

GO a step further: Why does not some hustling merchant fit a place in the tonneau to carry thermos bottles. Many use a combination kit to hold a couple of thermos bottles and a small lunch box, but when we take it there is the necessity of strapping it in place for fear the bottles may get broken. It is nearly as essential to have thermos bottles and a lunch on a tour as it is to have cushions on the seats. The manufacturer who takes this question up in earnest will do a great good. We need such and need it badly.

Congested American Thoroughfares



BROADWAY, LOS ANGELES, CAL., DURING AN ORDINARY DAY
EASTERN visitors claim that it is harder to drive through the traffic in Los Angeles than in any other city in America on account of the narrowness of the streets, the great number of street cars and machines parked along the curb. Even on Broadway machines are parked along the curb from early morning until late at night. On account of the light it was necessary to take the photograph early in the day. The congestion is even greater in the afternoon.



Make Roads of Molasses

Lime Rock, Water and Oil Combined with the Sugary Liquid

So Hard Half Hour After Rolled That Wagons Fail to Dent It

HOW to make roads out of molasses—good roads that the crows will not peck nor the bees swarm upon—was the subject of an address during the convention of the Washington State Association of County Engineers, by H. K. Brown, professor of chemistry at the University of Washington.

Prof. Benson, with the eye of a seer, also laid bare the future and told how an asphalt substitute can be made out of lignite coal. Prof. Benson said there is enough coal in the United States to last for 3,000 years.

The formula for a molasses road, according to Prof. Benson, is lime rock, water, oil and molasses. Lime rock forms about two-thirds of the mixture, molasses 2 per cent of the whole.

"Maple sugar or anything with sugar in it would do," he said. "These, however, are too expensive. The molasses used is the waste of sugar refineries.

"I have seen a road of this kind," he declared, "that was so hard a half hour after it had been rolled that wagons went over it without leaving a mark.

"The use of coal tar in road construction is not new, and to a very limited extent wood tar also has been used. These tars have not generally been found satisfactory when compared with asphalt. But the latter, before it can be used is subject to a strict scientific method of manufacture or fluxing."

7,000-MILE TRIP; \$62.20

Dallas, Tex., Sept. 25—On a wager of \$1,000, based on the expense for gasoline and repairs for a 6,000-mile trip, R. E. Callahan was the winner over two other cars in a Cole eight. Callahan drove nearly 7,000 miles, spending only 5 cents for repairs and \$62.15 for gasoline. The trip was through Dallas, Denver, Omaha, Chicago, St. Paul, Duluth, Green Bay, Chicago, Detroit, Indianapolis, St. Louis, Kansas City, Oklahoma City, and Wichita Falls, returning to Dallas.

To Teach Traffic Rules

Manchester, N. H., Citizens to Co-operate with Crossing Police

Suggested That Boy Scouts Tag Traffic Law Violators

MANCHESTER, N. H., Sept. 22—Education in traffic regulations will be taken up in Manchester Saturday, September 30. The Chamber of Commerce is making the plans.

Governor Spaulding has designated that day good roads day for New Hampshire, which was one reason for planning the traffic education. There will be policemen at all crossings and the drivers of vehicles will be instructed as to what they must do and pedestrians also will be given a lesson as to what they should do to cooperate with the police and other users of the highways. A suggestion under consideration is to have a squad of boy scouts who will tag all people who violate the traffic rules so that those who do not obey the regulations may know it. The motorists are enthusiastic over the plans.

ANYBODY SEEN DIOGENES LATELY?

Douglas, Ariz., Sept. 25—The Douglas Motor Co. met a threatened gas famine in Douglas recently in a unique way. When army officers requested the local Standard Oil agency and other oil companies to hold their entire supply for the use of the war department, car owners found themselves unable to buy gasoline at any price. One dollar a gallon and even higher prices were offered, but without success. The next day the Douglas Motor Co. advertised that it would sell 380 gallons of gasoline remaining in its tanks at the customary rate, declaring that they preferred to protect their customers rather than sell at \$1 a gallon. Other firms fell in line and gasoline was cheap while it lasted.

POLICE SEEK MOTOR CODE

Milwaukee, Wis., Sept. 23—Wisconsin police chiefs will go before the state legislature at its next session, in January, 1917, and ask for the passage of a broad-gauged uniform motor code to apply to all communities in the state and cover all angles. Although there now is a motor code on the statute books, passed in 1913 and amended in 1915, it has become antiquated because of the rapid development of new conditions affecting the use of motor cars. The chiefs admitted that many unnecessary arrests are caused by conflict in traffic and speed regulations in various communities. The opinion was expressed that a motor code uniform for the entire country by states would receive support from the chiefs' association.

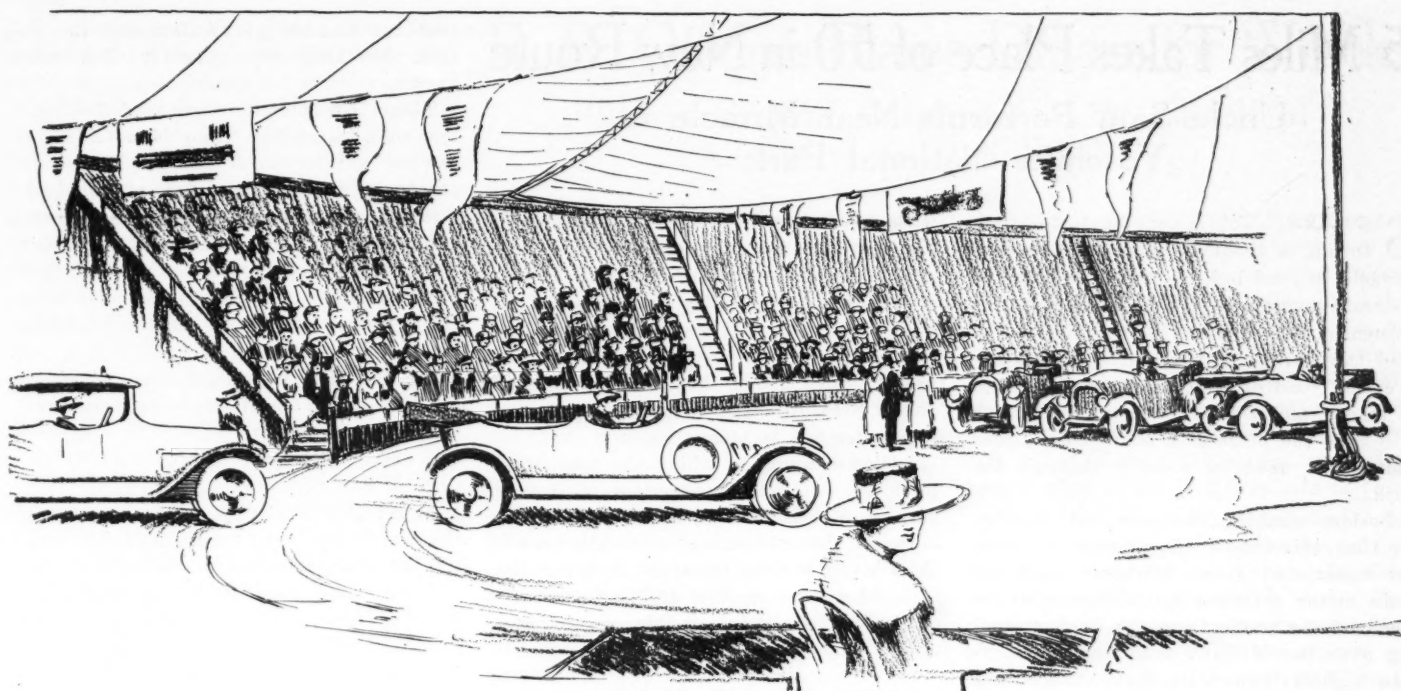
See America First —
• • • See America Now



NO. 96—OLD MILL NEAR JALAPA, IND., WHERE POET MILLER WAS BORN

ABOVE is shown the old water mills near the home of Joaquim Miller, the "Poet of the Sierras," at Palapa, Ind. Miller's sobriquet would not indicate that he was Hoosier-born. Indiana writers knew Miller for a Hoosier as well as for his works that gave him his well-known title.

EDITOR'S NOTE—This is the ninety-sixth of a series of illustrations and thumb nail sketches of the scenic and historic wonders of America to be published in Motor Age for the purpose of calling the attention of motorists to the points of interest in their own country.



A Show for Charity—A Boost for Dealers

Fashionable Chicago South Shore Country Club Fair,
While Successful, May Be Improved

By Ruth Sanders

CHICAGO, Sept. 23 — Club carnivals, charity fairs and bazars may contain profitable opportunities for dealers who wish to get their cars directly before a select car-buying public. This is what Chicago dealers found in the county fair held in the interest of charity September 20-30 by the South Shore Country Club, one of Chicago's most representative and largest clubs.

More than forty dealers took part in this, the second annual drive for charity—took part through exhibits of their latest models in a section labeled "the Review of Motor Fashions." Circus, popcorn seller and joy zone in general vied with touring car and closed car for attention. That the touring car and the closed car got attention is shown in the consensus among the dealers, "It pays."

Various charity organizations had charge of booths, which skirted an arena in which acrobats did amazing things; "the world's highest diver" thrilled a dry land audience, and flying humans were of breath-holding interest. Near the entrance to the zone a music-making wagon, joyful relic of a bygone primary campaign, tuned cheerfully while the merry-go-round spun busily with a passenger list that included the cream of Chicago society.

The members of a zoo posed. The farm had exhibits. There was a floral display. A \$50,000 radium exhibit had a tent of its own. Chickens worth \$5 and chickens worth \$1,000 engaged in a poultry show. An animal circus, athletic contests, bait and flying tourney, equestrian tournament,

cavalry drills, boxing, wrestling, steeplechases, shows of the "Texas Tom's Wild West" type; it is only to begin to tell what was there.

Whether such entertainments will offer profitable opportunities to the dealers in other cities and what amount of opportunity they will offer depend somewhat on the manner of exhibition, and this year's exhibition in Chicago has resulted in several suggestions for future displays.

Motor row at the fair was what its name suggests—a row, with some cars near the logical entrance of the row and others far away from the entrance. A cinder drive led between the wooden shelters which had been built for the exhibits. While this drive was kept sprinkled, it was not as satisfactory as it might have been, because it was hard to walk on and dusty in spite of the sprinkling. If the visitor walked on the floor planking in front of the cars, the full effect of the exhibit would be lost by the nearness.

The ideal arrangement seems to be that which would permit an all-around view of the car, together with some actual demonstration. A plan of such nature is being considered for the Chicago dealers next year. A circus tent has been suggested, the car to have the center of the ring and

the demonstrator to be the ringmaster. Seats would be arranged as in a real circus so the spectators could watch the whole show in comfort. A parade might start things off. Then would come separate showings. It has been suggested that each car might be allowed 5 minutes for demonstration.

If this plan is carried out, it will set a precedent which should bring even greater results to the dealers who took part in the exhibit, for this year's fair resulted in sales the first day. With the cars in action, the crowd would be as much interested there as out in the open with Tom, Dick, or Harry giving his free act show. Part of the tent could be available for parking cars for closer examination, such as in the row plan, which offers this opportunity as it is.

A semi-circular arrangement also has been suggested. It would eliminate the aloofness of the exhibits from the rest of the fair and each car would have an equal chance to get first notice. Those at the far end of the usual row would find themselves sharing the same favors as those at the near end.

If the semi-circular or circular plan of exhibit is not used, there could be room for demonstration outside the place of exhibition.

The main result of the motor show in connection with the charity fair is to demonstrate that "it pays." Just how much it pays is a question of time as in other efforts made to bring cars of different makes before the public.

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5 Miles Takes Place of 50 in New Route

Uncle Sam Performs Near Miracle in Yosemite National Park

SAN FRANCISCO, Cal., Sept. 23—California is about to experience another miracle in road building, this time by the federal government. The setting is the Yosemite National park. Uncle Sam promised that within a year he will complete a cut-off road of a little less than 5 miles in length, and a 6,000-foot tramway, which will take the place of a 51-mile circuitous route now used in passing through the park.

Besides slashing distance and shortening time, this cut-off will afford a new view for motorists. From Westgard pass the main motor entrance to California where much of the traffic from the East, traveling over the Midland trail and the Lincoln highway comes in, the distance into the Yosemite proper is 178 miles. From a point just north of the Valley, the road makes a great loop of 51 miles, yet when this 51 miles has been covered, the motorist finds himself only 6 miles from the start. It is across this narrow isthmus that the new road and tramway will be constructed.

Appropriation Practically Certain

It is understood that there is no question about getting the \$200,000 appropriation from congress. Preliminary work is already begun and a power plant to operate the tramway soon will be started. The incline will have a drop of 3,000 feet with a uniform grade of 50 per cent and a double track. It will be capable of carrying 250 cars and their passengers in each direction daily. Motor cars will be driven on to the tram cars at either the top or bottom and moved up or down, while the occupants

without leaving their seats enjoy the scenery as well as the novelty of the ride.

The elevation at the top of the incline is 7,000 feet. The valley floor is 4,000 feet, while Porcupine flat, which is at the highest point in the road is 8,000 feet. The first 2 miles above the tramway will be on an 8 to 10 per cent grade, while the remainder will be almost level.

Indian canyon, in which the tram is to be built, is about one-quarter of a mile east of Yosemite falls, but a peak rising between the incline and the falls makes them invisible from the tram. It is planned to build a hotel on this dividing peak, access to which will be possible only by way of the tramway.

COUNTY JEALOUSY BOOSTS ROADS

Marquette, Mich., Sept. 23—County jealousy as well as popular sentiment are given as the reasons for the excellent motor-ing roads in Clover-Land. These are also the reasons for the proposed expenditure of nearly \$1,000,000 for bettering the highways next year.

For many years the fine highways which were made necessary by the mining and timbering industry were unknown to the persons outside of the upper peninsula of Michigan. Gradually the number of motorists has increased each year until this summer there were tourists from practically every state in the Union.

No advertising campaign was used to attract motorists here until last winter when the roads of Clover-Land were charted in the Blue Book. Next year it is expected that more advertising will be done and

that the number of tourists will far exceed anything this country has ever known.

There is a 500-mile stretch of fine touring road extending from Menominee, at the gateway to Clover-Land, to Keweenaw point, the most northern part of Michigan. The road extends through fine agricultural sections, past iron and copper mines, through the heart of great forests, into hustling cities and villages and over beautiful streams as well as close to historical locations.

Besides this wonderful drive there is the Clover-Land trail extending from Ironwood on the west to Sault Ste. Marie on the east. This trail is not entirely improved, but the work is still under way. It is ready for tourists, however, most of the way. The road was joined last summer at a large barbecue celebration.

Clover-Land counties will probably get \$400,000 from the government good road fund and will add more than that amount. Keweenaw county will spend \$50,000 alone on its highways in order to claim the best highways of Clover-Land.

LINCOLN MARKERS STANDARDIZED

Detroit, Mich., Sept. 23—Widespread attention has been called to the stupendous task undertaken by the Lincoln Highway Association in standardizing and re-painting the markers along the route from coast to coast. The association has been heartily commended for its endeavor in taking up and completing this important work. For practically the entire season, a crew of experienced painters have been at work on the Lincoln highway, repainting markers, and standardizing the marking system, all right and left-hand turns being clearly indicated and the confusion often arising at cross roads being done away with. A well marked road is most heartily appreciated by the tourist and the demand for such systematic and comprehensive marking has extended in all directions since the precedent was set along the route of the Lincoln highway.

COLORADO TOURING RECORD

Denver, Colo., Sept. 23—Motor touring in Colorado has been the heaviest this year ever recorded and visiting motorists in great numbers are still coming in every day from near and distant states for outings in the scenic Rockies. Hotels in Denver, Colorado Springs, Manitou, Idaho Springs, Estes Park, Glenwood Springs and scores of other resorts have been crowded all summer as never before, while camping grounds in public and private parks and along fishing streams, lakes, canyons and all sorts of attractive spots through the mountains have been used by thousands. It is estimated that fully 25,000 motorists have been furnished road information by the Denver Motor Club alone, where visitors have numbered as high as 200 a day, from as many as 20 states. Every state in the Union has sent tourists this



SHE BACHELORS SCORN MALE AID—Two San Diego bachelor ladies are making a tour of forty-three states in an Overland, calling on the governors of each commonwealth and extending to them an invitation to the San Diego fair. The lady drivers, unescorted, are already through Colorado. They expect to make the northern states this fall and tour the south this winter. Above they are shown greeting Governor Carlson of Colorado.

year. Canada, Mexico, China, New Zealand and other foreign countries have also been represented during the summer.

While there has been a great deal of travel on through Colorado to Yellowstone National Park, Grand Canyon and other points of touring interest, the length of stay in this state has shown a far higher average than last year, when such a large proportion of the motor travel through this section was bound for the expositions in California. Stays in Colorado have ranged from a few days to 3 or 4 months, with the average about 3 or 4 weeks.

GILBREATH LEAVES DIXIE HIGHWAY

Indianapolis, Ind., Sept. 25—William Sydnor Gilbreath has resigned as traveling secretary of the Dixie Highway Association. Mr. Gilbreath has been one of the best-known figures in the development of through routes in America, having been associated with Carl Fisher in the early days of the Lincoln highway, and after the preliminary work on that was done, carrying forward similar work for the Dixie Highway Association. His future plans are not announced.

FOUNTAIN AT TRAIL JUNCTION

Chicago, Sept. 25—The junction of the Lincoln and Dixie highways, at Chicago Heights, will be marked by a bronze drinking fountain erected by the members of the Arche Club, and the dedication will take place October 9. The fountain which is the work of George E. Ganiere, is a rustic well, 8 feet in diameter, surmounted by a decorated bronze stand with the Arche Club crest at the top. Under this is a bronze plate on which is engraved Lincoln's Gettysburg address, and a bronze bas relief of the great emancipator. The site is donated by Chicago Heights.

WILL COMPLETE JACKSON TOUR

Louisville, Ky., Sept. 26—The southern end of the Jackson highway will be put under the glass for approval when officials and newspaper men embark from Nashville, Tenn., next Monday morning, October 2. President Peter Lee Atherton advises Motor Age that the inspection party will take a little over 2 weeks in making the trip.

A year ago a similar inspection was made of the two proposed routes—the one through Mississippi and also through Alabama. A choice was difficult and the two states were put on probation with the admonition that the one which showed the best road at the end of 1 year would get the official routing.

This party starting next week will set in judgment as to which route is better. The itinerary and dates follow, the cities given being the night controls:

October 2.....	Florence, Ala.
" 3.....	Columbus, Miss.
" 4.....	Meridian, Miss.
" 5.....	Hattiesburg, Miss.
" 6-9.....	New Orleans, La.
" 10.....	Pass Christian, Miss.
" 11.....	Mobile, Ala.
" 12.....	Thomasville, Ala.
" 13.....	Montgomery, Ala.
" 14-15.....	Birmingham, Ala.
" 16.....	Huntsville, Ala.
" 17.....	Nashville, Tenn.

R. R. Officials Blame Drivers for Wrecks

Illinois Central Conducts Secret Check of Accidents on Road Crossings

BLOOMINGTON, Ill., Sept. 25—Motor car drivers are careless at grade crossings. This is the consensus of Illinois Central officials. With a view of reducing the number of motor car accidents at grade crossings, the Illinois Central has been conducting a secret check of the actions of all drivers of vehicles in approaching the crossing of that corporation. Watchmen, hidden from view, have been stationed for 12 hours at a time with instructions to keep an accurate record of all vehicles crossing the tracks.

The reports are now being made public and indicate that a large proportion of drivers ignore safety precautions. The report from the Grant highway near Freeport in Stephenson county is a criterion of the others. In the 12 hours in which the record was kept at the Grant crossing ninety-four cars containing 236 persons, approached the crossing at full speed, the driver not making any effort to detect the approach of a train. Twenty-three cars, containing sixty-two persons, went over the crossing, in which the driver looked one way only. Forty-nine cars with 127 persons went over the crossing in which the driver looked both ways when more than 20 feet from the crossing. Five cars with nineteen persons, went over the crossing, the driver not looking both ways

until he was within 20 feet of the crossing and impossible to stop. The proportion of teams, motorcycles, and bicycles which went over the crossing, indicated about the same proportion of carelessness. To recapitulate, the drivers of 122 cars made little or no effort towards protecting their own lives or those occupying the car with them. The drivers of one-fourth of the cars going over the crossing, made the proper effort to see if it was safe to pass.

The Illinois Central management is desirous of securing the co-operation of the public in increasing the element of safety and reducing the number of fatalities. The check of the various crossings taken, indicated that two-thirds of the drivers go over the crossings at a speed of 30 miles per hour, while the proportion of those who crossed at a speed of 3 to 5 miles per hour and with their car under control, ready for an instant stop, was distressingly small.

CROSSING COUNTRY IN TRUCK

Chicago, Sept. 25—To demonstrate the practical advantages of the National Parks Highway for business purposes, William Warwick is driving from Seattle to New York City, in a G. M. C. truck loaded with a ton of Carnation condensed milk, a product of the dairying section of western Washington. The total distance is 3,640 miles and Warwick expects to make the trip in 30 days, not counting the time spent at stopping points en route. The milk was consigned to a New York buyer.

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MONTH-OLD BOY TAKES LONG RIDE—A baby boy not yet in the speaking or walking stage has just returned to Jackson, Mich., after a tour with his parents, Mr. and Mrs. C. H. Baker, from that city to Seattle and return. The rear seats of the Briscoe cloverleaf roadster were removed and the infant, 2 weeks old at the start, was suspended in a clothes basket hung on springs.

Vanderbilt Field Big \$15,000 in Prizes Has Been Hung Up for Coast Classics

Two Events Will Carry 1,900 Points
in Championship Award

SANTA MONICA, Cal., Sept. 23—Thirty-five cars are expected to start in the Vanderbilt cup and grand prize races, November 16 and 18. Prizes totaling \$15,000 will be hung up, each event to carry an equal amount. The division of prize money will be the same for both races, namely, first, \$4,000; second, \$2,000; third, \$1,000; fourth, \$500.

The Vanderbilt cup will be 294.03 miles, and the Grand Prize, 403.24, both being run over the same course, which measures 8.4 miles. The Vanderbilt cup race will be a Class E event open to motors of 600 cubic inches displacement or less, while the grand prize will be a free-for-all, Class D event. Entries for both events will close at noon November 11.

The total points carried by these two events toward the championship award will be 1,900. Inasmuch as these two meets are in the A. A. A. award of points, it is likely that all of the leaders at present will enter.

Miss Lorna Avery, Universal movie girl, has been selected as official mascot for the races. She is said to have been selected from among fifteen other film favorites chiefly for her personal pulchritude.

PHOENIX RACE NOV. 18

Phoenix, Ariz., Sept. 25—A 100-mile, free-for-all track race for cars and drivers of Arizona, New Mexico and Texas under A. A. A. sanction will be the main speed feature at the Arizona State Fair here November 18. A purse of \$2,000 has been hung up for the southwestern drivers entered in this race, and will be split \$1,000, first prize; \$600, second prize; \$300, third and \$100, fourth.

Explaining its departure from the practice of former years, the Arizona state fair commission has issued a statement to the effect that the fact that Barney Oldfield, Earl Cooper and other professional exhibition drivers have raced at the state fair in the past and run away with all the money, has had a tendency to discourage the drivers and car owners of Arizona. The commission decided to confine these events to the southwest and distribute this money among local drivers. The local interest which will attach to a car from any given community in the state will in the estimation of the commission more than offset the drawing power of drivers of the Barney Oldfield type.

The state fair commission has applied to the A. A. A. for sanction for a road race from Douglas, Arizona to Phoenix over the Borderland highway, to be run November

13, the opening day of the fair. A purse of \$1,250 will be offered for this event, split \$600, \$450 and \$200. A 5-mile elimination contest limited to cars entered in the name of some city in Arizona with a \$100 silver trophy and \$150 cash prize, and a series of races between stripped-down Ford cars from Arizona, New Mexico and Texas will be other features of the racing program. A \$250 purse is offered for the latter events.

SPEEDWAY MEETING SEPTEMBER 29

New York, Sept. 23—Representatives of speedways in Tacoma, Indianapolis, Chicago, New York, Cincinnati, Providence, Des Moines, Omaha, Kansas City and Sioux City will meet in this city September 29 to fix the speedway racing dates for 1917. Some of these tracks are represented by three or more which brings the gathering up to twenty-five or thirty.

DENVER OLDSTERS' SOCIABILITY RUN

Denver, Colo., Sept. 23—Fifteen cars of Oldsters from Denver and vicinity left this morning for a 2-day sociability run of 350 miles to Morrison, Baileys, Fairplay, Buena Vista, Salida, Hartsel, Florissant, Manitou, Colorado Springs, Palmer Lake and home. The run was conducted by W. W. Barnett, Oldsmobile distributor for Colorado and adjacent Rocky Mountain territory, who sent his customers a neat card outlining the schedule and probable expense of the trip and urging them to take part for the good time and the benefit of getting better acquainted with their home state roads and scenery.

OGREN GETS NEW MOTOR

Los Angeles, Cal., Sept. 25—The Harry A. Miller Mfg. Co., has just completed a new racing motor for Hugo W. Ogren, of the Ogren Motor Car Co., Chicago. This motor has recently undergone block tests, developing 135 horsepower at 2,900 r. p. m.

The motor is of Miller's own design and has several unique features that differ from other motors. The water manifold is cast integral with cylinder head and side plate. Likewise all oil leads are cast in the crankcase and cylinders, eliminating pipe lines. The valve action has a follow cam that makes the rocker arm follow the cams. As a consequence, lighter inlet and exhaust springs are used on the valves, as they only have to close the valves and do not have to return the rocker arms as in other motors.

The motor has a bore of 3½ and a stroke of 7 inches, has a four-ball-bearing crankshaft, double set of ball-bearings being used on the flywheel end of the shaft. All valve mechanism is under cover.

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Speedw'y Managers Meet

Contest Board of A. A. A. to
Draft Schedule of
Races

Plan to Arrange Schedule So That
No Dates Will Conflict

NEW YORK, Sept. 25—The Contest Board of the American Automobile Association has called a meeting of managers of the various speedways for Friday, September 29, in this city, for the drafting of schedules of meets for next season. The day set is just before the Astor cup race and a good representation of speedways is expected. It is planned to arrange a definite schedule that will give all of the large speedways good dates and at the same time avoid conflicts.

The board expects to recommend that no Sunday dates be included. There is, among racing men, a strong aversion to Sunday speedway events. Several drivers have strong scuples against Sunday driving and one or two of the racing teams are not permitted by their managers to drive on Sundays.

THIRTY-SIX ENTRIES FOR GOTHAM

New York, Sept. 25—Thirty-six entries have been received to date for the 250-mile Astor cup race to be held next Saturday on the Sheepshead Bay Motor Speedway. Entries close tonight. Eliminations will be held Thursday.

Car	Driver
Crawford	Merz
Crawford	Klein
Crawford	Chandler
Delage	Lecain
Delage	Devigne
Dans L'Argent	Muller
Duesenberg	Devlin
Peugeot	Resta
Hudson	Vail
Adams Special	Adams
Sunbeam	Christians
Sunbeam	Chevrolet
Duesenberg	Milton
Duesenberg	D'Alene
Mercer	Pullen
Mercer	Ruckstell
Duesenberg	Buzane
Blue Bird	Unamed
K. W. P. Special	Packard
Maxwell	Rickenbacher
Premier	Unamed
Peugeot	Aitken
Maxwell	Henderson
Premier	Lewis
Peugeot	Wilcox
Olsen	Watson
Olsen	McBride
Pugh Special	Meyer
Hoskins	Hughes
Erwin Special	Bergdoll
Mercedes or Peugeot	DePalma
Erbes	Gable
Omar	Toft
West Duluth Special	Rawlings
Ogren	Henning
Ogren	Burt

GIANTS DESPAIR CLIMB

Wilkesbarre, Pa., Sept. 23—The Giants Despair hillelimb, revival of which was told in Motor Age recently, will be held October 7 according to a sanction issued by American Automobile Association. The events are based upon the value of the cars.

There will be a match between cars listing under \$800, \$800 to \$1,200, \$1,200 to \$1,600, \$1,600 to \$2,000, \$2,000 to \$3,000, and \$3,000 to \$6,000.

Other events come under Class E, non-stock, open to Class C cars with less than 230-inch displacement; Class C, non-stock, division 6C, 231- to 300-inch; Class C, free for all; one for members of the Wilkes-Barre Automobile Club for cars costing under \$1,600 and one for cars owned by members of the Wilkes-Barre club, costing more than \$1,600.

A. A. A. CONTEST BOARD MEETS

Franklin, Pa., Sept. 23—Richard Kennerdell, chairman of the Contest Board of the American Automobile Association, entertained the members of the board at his home in this city during the past three days. In addition to board meetings much time was spent at the Wanango Country Club, where golf was the order of the day. Among those board members present were Messrs. Folwell, Ireland, Crosselmire, Sin-sabaugh, Beecroft and Barnes. John Wetmore and Clarie Briggs, of New York, were among the guests. The board decided to continue the schedule of championship speedway events for next year, and if possible increase the number. It is possible that such large speedways as New York, Chicago, Indianapolis and Cincinnati may have two championship dates and the other speedways one. It is possible that the method of championship awards may be altered in several respects.

BIGGER CADILLAC TRUCK PLANNED

Cadillac, Mich., Sept. 22—The Cadillac Motor Truck Co., shortly will bring out a 3½-ton truck. The biggest truck made thus far by the company is a 2-ton model.

ASK NEW SPEEDWAY RECEIVER

St. Paul, Minn., Sept. 25—A new receiver for the Twin City Motor Speedway Association has been asked by attorney for the bondholders on the ground that the present receiver named by the Ramsey county district court is unable properly to protect the property for lack of funds. The receiver, P. W. Herzog, is believed to oppose foreclosure of the mortgage held by the bondholders and is said to have canceled \$100,000 fire insurance because there is no money to pay premiums.

8-FOOT CAR STOP RULING

Savannah, Ga., Sept. 23—Requiring vehicles nearing a street car which has stopped to let passengers off or on, to be checked not less than 8 feet distant, has been proposed by the city council.

The amendment also prohibits the vehicle from starting again until the street car is in progress and all people leaving it shall have reached the sidewalk. The proposed amendment will probably be considered at a public hearing.

League V.P. Guilty

Van Auken Paroled for 2 Years After 7 Months in Union- town Jail

Bidwell Makes Refunds to Victims —Trial in New York

BUFFALO, N. Y., Sept. 25—Harry A. Van Auken, said to be vice-president of the international Automobile League of Buffalo, who has been in jail at Uniontown, Pa., since March 8, charged with conspiring to defraud, by Fayette county officials, has entered a plea of guilty and has been paroled for 2 years.

Richard H. Lee, special counsel for the National Vigilance Committee, who brought about the action in Uniontown against officials of the League, consented to a nolle of the Uniontown indictment against A. C. Bidwell, president of the league. This was done in view of the fact that Bidwell is to be tried in the Federal courts of New York state early this fall, and that Bidwell has been forced to pay back all of the money taken from Fayette county people by agents of the league, and pay back all the expense to which the county and individuals have been put in prosecuting him and his agents.

The postoffice fraud order issued on August 3, against the International Automobile League, and subsequent fraud orders against concerns formed to evade the first order, have put the league out of business completely.

INCREASES IN CAPITAL

Grand Haven, Mich., Sept. 22—A meeting of the stockholders of the Alter Motor Car Co., has been called to vote upon a proposition of the officers to increase the capital stock of the company to \$500,000.

Big Rapids, Mich., Sept. 20—The capital stock of the Four-Drive Tractor Co., is to be increased from \$50,000 to \$200,000.

BRANFORD CARBURETOR CONTEST

New York, Sept. 25—In order to demonstrate the possibilities for increased mileage and flexibility with the Branford carburetor, for which it has recently been appointed New York City distributors, the Hennessy Auto Repair Co., Inc., is conducting a prize contest, open to all Ford car owners in greater New York. The total amount to be awarded is \$300 in gold, covering nineteen separate prizes ranging all the way from \$100 to \$5.

The first prize, \$100, goes to the Ford

owner who shows the best performance over a period of 30 days. A suitable blank is furnished on which he gives the details of his 30 days' experience. The contest opened today and entries may be made any time up to November 9. The contest closes December 9, giving the contestant ample time to make two separate tests, thereby doubling his chances of becoming a prize winner. Awards will be announced in a bulletin to be issued by the Hennessy company, December 23. The judges in the contest will be trade journal representatives.

KELLY-SPRINGFIELD MAY MOVE

Akron, O., Sept. 22—The Kelly Springfield Tire Co., is considering the removal of its plant from this city to Cumberland, Md. If moved, the plant will be tripled in capacity. The Akron plant will be sold for \$750,000 it is expected and negotiations are under way for the donation by Cumberland of \$750,000 and a 75-acre site. The company now employs 1,500 men, but in Cumberland, would have 3,000. Kelly Springfield is paying \$4 a share and earning about \$12.

SPICER MFG. CO. PURCHASED

New York, Sept. 26—Special telegram—The Spicer Mfg. Co., Plainfield, N. J., one of the largest manufacturers of Universals in the world, has been purchased by a banking syndicate headed by Merrill Lynch & Co., New York. The name of the company will not be changed, but will have \$1,500,000 first preferred 8 per cent stock which is now offered at \$100 per share, 500,000 second preferred and 5,000,000 common. The factory is being expanded and it is said that production for 1917 will be approximately 700,000 Universals.

PACKARD BUYS BUFFALO PACKARD

Buffalo, N. Y., Sept. 22—J. W. Packard, who founded the Packard Motor Car Co., Detroit, Mich., and who gave his name to the car, has re-entered the motor car industry and with the same company. He has purchased the Buffalo interests of the Packard Motor Car Co., of New York, and will conduct the Buffalo branch as an agency.

Mr. Packard is president of the new business which is called the Packard Buffalo Motor Co., Inc. B. C. Day, former manager of the branch is vice-president and the other directors are: W. D. Packard, capitalist, a brother of the president; E. C. Sutton, president of Wheat's Ice Cream Co. and L. R. Davidson, of the Davidson Ore Mining Co.

The first Packard car was built in Warren, O., by J. W. Packard in 1899, and the present business has grown from that beginning. While it was still in its infancy, J. W. Packard sold his interest to the group which now controls it and has not been actively connected with the motor car industry since.

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Sixth City Makes Rapid Progress

Cleveland's Stride Toward Motor Car and Parts Industry Absorbing Topic

CLEVELAND, O., Sept. 23—The progress that Cleveland is making in the motor car industry is one of the topics of the day with manufacturers. Within the last year Cleveland's list of car and accessory factories has grown more rapidly than that of any other city, and each week brings announcements or rumors of other concerns moving to this city.

Within the last few months several new factories have been built, and others are being built and arranged for at the present time. The Jordan Motor Car Co., located here some months ago and is now nearly at schedule production. The Grant Motor Car Co., Findlay, O., has its new factory nearly completed and will be occupied in the near future. Within the last few weeks the Abbott Corp., of Detroit, announced that it would locate here.

There is a new factory within process of construction for the Dann Products Co. of Chicago. Within the last few months the Dinneen Motor Co., truck manufacturers, has located here and is now well under way with production. There are other rumors in the air and it is expected that within the next few months notices of other concerns locating in Cleveland will be made.

Cleveland is admirably located as a railroad distributing center. It has excellent shipping facilities over the New York Central system and its various lines controlled by it, such as, Lake Shore & Michigan Southern, and Big Four. It has every facility over the Pennsylvania lines, not to mention the many other railroad systems entering the city. This fact in itself is a big consideration with shippers.

New Concerns Locate There

In addition to new concerns locating in Cleveland, the car accessory industry has been growing rapidly. Many factory additions are at present under way and new plants are being built.

One of the greatest factory activities is that of the Willard Storage Battery Co., which started its new factory 5 miles from the heart of the city some 3 years ago and which it has since operated in addition to its old factory near the center of the city. At present the new factory is being quadrupled in size and when completed, in a few months, will have capacity of 10,000 to 12,000 batteries per day. At present the capacity of the two plants is 4,500 per day, with a working force of 2,000.

The new factory is located in that section of the city known as Collingwood, which is served by the Cleveland Belt Line railroad which furnishes ideal shipping facilities, Willard having switching accom-

modation of 38 cars. The company has 16 acres of land, 10 acres of which are already built upon.

The new buildings now in process of construction will give every manufacturing facility. One building for the moulding and pasting department measures 78 by 304 feet. Work is nearly completed on a special building for assembling and battery forming which will have 90,000 square feet of floor area. The building is one-story and measures 300 by 300. There is another building, 200 by 85, which will be used as an engine room and power house. When the new buildings are completed there will be a special one for the manufacture of batteries for train-lighting purposes which is a growing part of the work. It is hoped that by January 1 all of the Willard work will be carried on in this new plant.

Production Hastening the Watchword

Every feature to hasten production has been looked after in the new building. It is a daylight plant all through. The wood working department where battery boxes are made has capacity for 10,000 boxes per day. In connection with these batteries all metal parts are lead plated, lead plating being a new process in which a coating of lead approximately .005-inch thick

is deposited on all handles, screws, etc. By this means there is no deterioration or corrosion due to acid. A feature of the new plant is an electric testing device for the different battery jars by which the smallest holes or thin spots can be detected. An alternating current of 24,000 volts is used in the test, which is proving so complete that the company replaces any jar in 6 months if returned to the branches or service depots.

An important department of the new factory is the die-casting division where all of the grids are manufactured. This department is housed in a long rectangular room down the center of which are twenty-four furnaces for heating the metal, and with facilities for four or five men with die-casting machines working from each furnace. Factory arrangements are such that the grids are transported but a short distance to the trimming presses where all of the surplus metal is punched off.

A novel feature of the factory is a smelter department in which all the good metal is reclaimed from the cleanings of castings, etc.

Study in Motion

The new factory incorporates a refrigerating test room in which it is possible to test a manufacturer's engine with starting-lighting apparatus, battery, etc. The motor unit with battery, etc., is mounted on a heavy truck which runs on a track into the refrigerating room where a temperature of 20 below zero is maintained. The engine is controlled from the outside, so that it is possible to test the efficiency of the battery for starting all kinds of motors in this temperature.

In the pasting department, motion study has resulted in the use of an endless belt which passes between the work benches of those pasting material in the grids. Once the grid is pasted, it is placed on a traveling belt which carries it to other parts of the factory where the drying is done. Another example of labor economy is the use of eight Ellwell-Parker high-low industrial trucks used for transporting trays laden with plates, or other goods around the factory. In no part of the new plant has anything been left undone to economize labor and make working conditions better.

In the plate-forming room, which is 300 by 140 feet, there is a change of air five times every hour and ten times if necessary. This is because of the gases given off in charging and forming the plates.

The factory is well supplied with auto-

(Concluded on page 32)

Mitchell Sales Organization Is Revamped

RACINE, Wis., Sept. 26—Special telegram—The return of O. C. Friend to the Mitchell company as president and general manager has made necessary certain changes in the sales organization of that concern, and it is noteworthy that Friend has not gone outside of the Mitchell organization for his material. The post of general sales manager, left vacant by Mr. Friend, has been filled by John Tainsh, formerly assistant sales manager. Mr. Tainsh's close association with Mr. Friend makes certain that the former policies will be continued. George W. Hipple retains the office of general merchandising counsel. There are now three assistant sales managers, Frank W. Pelton, for 3 years in charge of advertising, adds to his duties of advertising manager that of assistant sales manager in charge of western sales. William Lininger, formerly eastern field representative, becomes assistant sales manager in charge of eastern sales, and F. W. Archer, sales manager in charge of distribution. Frederico Sarda, at present abroad in the interest of the company, continues as foreign sales manager.

American Hospital in Paris



Nurses, surgeons and chauffeurs at American Hospital

THE men who volunteer to drive ambulances for the American Hospital of Paris are a red-blooded and cosmopolitan lot. The majority of them are Americans, but they hail from other lands as well and are men of varied estates. Humanitarian motives explained the presence of some in the war zone, though it is probable that the lure of adventure called most of them.

Last summer we had with us Henry Synor Harrison, the novelist; Capt. Cunningham, the big game hunter; a Spanish count, an ex-circus clown—one of our most efficient workers, by the way; a lanky schoolmaster from the mountains of Virginia; a Texas lad of 20 who started from home with \$2 in his pocket and worked his way over on a cattle ship; a locally famous race driver.

A Notable Cast

Then there was the versatile Freddy Bate, a Chicago boy, who once fought a bull in Madrid with a Ford. He said the Ford was stripped, and very likely it was—after the encounter. Another young man enjoyed some prestige for having driven a Ford across the Andes. Besides these distinguished personages were a prominent sculptor, a well-known architect, a painter of international fame, several magazine illustrators, a dancing master, three or four actors and quite a number of the idle rich who were kept mighty busy that summer. In short, every nervous mother's son of them had considerable of a career

By Hi Sibley

back of him with the prospect of a much livelier one ahead. Several of these men have been in the recent terrific fighting around Verdun.

Requirements for eligibility to the ambulance division are manifold. First of all, the applicant must satisfy the committee on enlistment that he is not unfriendly to the cause of France's allies. A rigid physical examination comes next, and passing that, the applicant must demonstrate his ability to handle a car and make minor repairs and adjustments. Then, having been accepted, he must agree not to write anything for publication during his enlistment. Newspaper applicants are regarded askance.

Whether he elects to go to the front or not, vaccination against smallpox and anti-typhoid inoculation are compulsory. From experience I pronounce this last anything but pleasant. Follows the official examination and road test for a chauffeur's license, and this being satisfactory the volunteer is given a printed pink slip to which his photograph is attached, permitting him to drive a car in Paris for 1 month.

If he is responsible for no mishaps during that time a permanent license, that is, one good for a year, is issued him. Besides all this there are multitudinous papers, passports and permits which must be signed, countersigned and stamped, and all of which have the bearer's photograph

pasted in one corner. One is obliged to carry a dozen photos with him, like so many postage stamps.

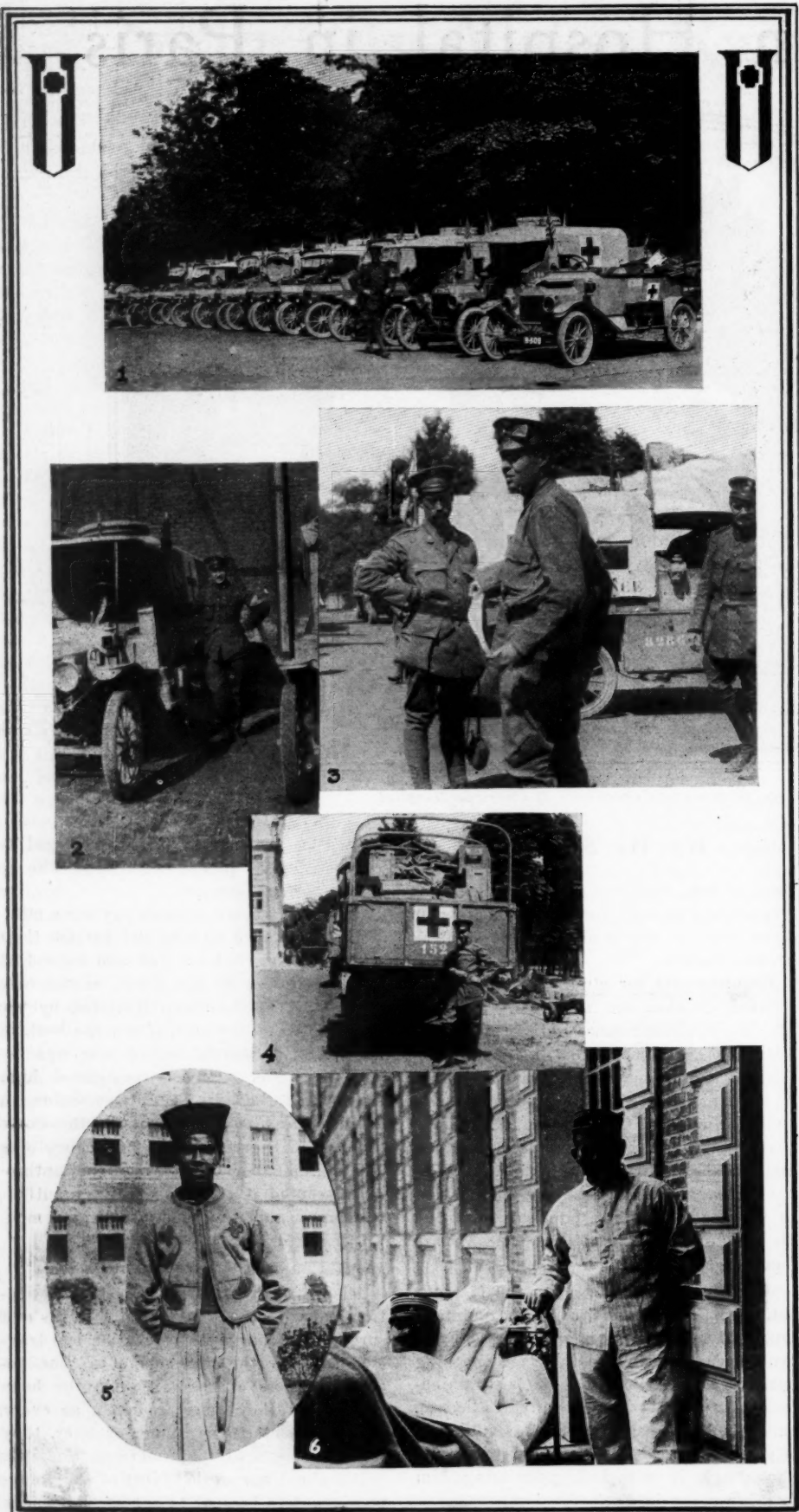
Volunteers serve without pay for a minimum period of 3 months and furnish their own uniforms, but are fed and housed at the hospital or at the front, as the case may be. The American Hospital, by the way, is one of the best, if not the best, in all France. Shortly before war was declared it was a nearly completed high school building in Neuilly-sur-Seine, a fashionable suburb just outside the Porte Maillot of Paris. Soon after hostilities began a number of American philanthropists secured it from the military authorities and completely equipped it as a modern hospital.

Institution Has 600 Beds

There are over 600 beds in the institution and with the American physicians and surgeons in charge its reputation has traveled all over the war zone. In Flanders many soldiers expressed to me the hope that, when they were wounded, as every soldier expects to be sooner or later, they would be sent to the American Hospital.

But about our work. Most of the volunteers want to be sent to one of the squads stationed at the front as soon as possible, but first they must take a 3 weeks' course of training in Paris. This is far from monotonous and an excellent preliminary for the gruesome and exacting work on the firing line.

Nearly every day, and sometimes twice



1—Row of Ford ambulances in Paris, donated by Americans. Staff car on right. 2—Henry Sydnor Harrison, novelist, author of *Queed* and *V. V.'s Eyes*. 3—Capt. Cunningham, the big game hunter, facing camera. 4—A camion attached to one of the ambulance squads about to leave for the front. 5—A Senegal nearly recovered from a jaw wound. 6—French captain, on bed, who received over twenty wounds defending a trench parapet

a day, we of the ambulance squad received a call to La Chapelle to bring in the wounded. La Chapelle was an immense freight warehouse on the other side of Paris that had been converted into a systematic hospital and receiving station. It is here that the wounded are brought in the specially-equipped trains for distribution among the thousand or so Paris hospitals.

The second night after I had donned my uniform we had an emergency call to send all our available cars. The impression remains vivid in my memory, as it was my first experience of the kind. As soon as the order was given we were off in a minute, every car in the yard. With Klaxons shrieking—ambulances alone were allowed to use them—we thundered through the darkened streets to our destination, scattering pedestrians from the right of way. There was no speed limit for an ambulance; Parisians knew the significance of its warning note.

At La Chapelle the ambulances are drawn up inside one end of a long freight shed as closely as they can be herded. The other end of the structure is occupied by a number of neat little cottages, about 20 by 40 feet, for receiving the wounded and caring for their immediate needs. The cottages are white and each trimmed in a different color; there is "maison rouge," or red cottage; a green cottage, a grey one, and so on.

Patients' Quarters Comfortable

Inside they are immaculately white and cool, with the spotless covers on the narrow iron beds thrown back in readiness for the incoming patients. Dainty Frenchwomen flit here and there making preparations to receive the wounded. At the entrance of each cottage is a bank of growing palms and flowers, and everything is made attractive and comfortable.

In the little houses the wounded are classified according to the nature of their injuries. Abdominal wounds go into the red cottage, for instance; leg wounds into the green cottage—the grey cottage is reserved for the gravely wounded who must be operated upon before they can be removed to a hospital. On that particular night I recall one handsome young lieutenant who was taken there in a dying condition; but he was too far gone to survive an operation, and the most comfortable ambulance was assigned to remove him to the nearest hospital.

There were 157 wounded, or "blessés" as they are called in France, on the first train that came in that night. The sight of them brought from the coaches, the overwhelming odor of mingled gangrene and anaesthetic, will never leave me. Three poor wretches had died on the train and as their covered bodies were carried out the officers and assistants stood in line and silently saluted. An appalling number of head and leg wounds were in evidence. Heads were so completely bandaged that in many cases only the nose protruded, and it seemed that nearly every third or fourth

stretcher bore a form with the outline of only one leg under the blanket. One pallid, wasted man carried past had the stump of a hastily-dressed thigh exposed, but weak as he was, made a pitiful effort to salute an officer as he was borne to the dressing room.

Each blessé has a tag tied to his garments stating his name, nature of his wounds and number of his regiment. An ambulance driver is given four slips and must seek the corresponding men in the various cottages. Inasmuch as all are classified, it is a simple matter to find the men, and when our consignment of four had been gently placed in the car by the station stretcher bearers, or "brancardiers," we slowly made our way back to the American Hospital.

Here the blessé's name and condition are recorded and then he is immediately taken to the bath room where, with utmost tenderness, attendants remove the grime of the trenches. The poor wretches actually smile as they are gently laved with warm water and soap. Following the bath is an operation or the usual procedure of a hospital.

Outcry Is Infrequent

In spite of the almost constant stream of badly wounded being brought in to the hospital, one rarely hears an outcry. On the contrary, an atmosphere of cheerfulness prevails. In the inner court one sees all sorts and conditions of wounded; some are totally blind, others have lost both legs and many have faces so disfigured that they will be monstrosities all their lives, and yet almost without exception they are ready with their joke and laugh. There was a French captain who had received over twenty wounds in defending a

trench parapet and for weeks hovered between life and death, but he never failed to greet us "Americaines" with a cheery smile whenever we went to see him.

On the sunny terrace an infantryman who had lost both legs used to amuse himself and compatriots by doing some fancy roller skating in a wheel chair; a tawney Turco whose face had been mutilated beyond any semblance to a human countenance completely forgot his misfortune in a sociable game of checkers; an English Tommy who had to have an infected leg amputated three times—piece-meal—was continually spoofing his Latin comrades in a pure brand of cockney, to their intense delight. Such was the spirit of the wounded.

As for the ambulance corps, with cus-

tomary American thoroughness it was kept at the very highest point of efficiency. If a car was temporarily disabled its place was immediately taken by a reserve, and during the heavy fighting every available car was kept going for days and nights without rest. The American drivers many times demonstrated the stuff that's in them, and if the time should come when Uncle Sam needs men of this sort he'll find a mighty efficient crew at his disposal.

STUDEBAKER'S DETROIT PLANS

Detroit, Mich., Sept. 22—On the announcement last week of the additions to the plants of the Studebaker Corp. to cost \$1,500,000, these to be made both here and at the South Bend, Ind., factories, specific information as to just what the Detroit appropriation would be used for was not available.

It is now definitely stated by officials of the big corporation that an increase of 3 per cent in the forge shop capacity here is to be made, as a result of contracts which have just been let for a battery of nine steam hammers, together with all necessary trimming presses, forging and heat-treating furnaces, representing an investment of \$150,000. All of the equipment must be installed and in operation by the first of the year, according to the contracts.

Other plans not yet ready for announcement will be worked out as business needs dictate. As was told last night, Studebaker has among its undertakings at South Bend a new foundry 1,100 by 150 feet, which is to be erected on part of the site now occupied by lumber yards of the works in the Indiana city.



B. F. Dawson and Mlle. Jeanne d'Alfonce, volunteer French nurse. Dawson came through the Dunkirk bombardment without a scratch and broke his arm 10 days later cranking a Ford



Front of the American Hospital at Neuilly-sur-Seine, Paris. Cars on right left for the front the day this picture was taken



From the Woman's Viewpoint



The Coat Hangs Low

Provisions for the Woman Motorist's Wraps Show Thought

THE woman motorist is particularly lucky in her coats. Hats and shoes for motoring only are not much in evidence. The woman prefers a small, close-fitting hat that offers no wind resistance for motoring. She selects a shoe with a sensible heel if she drives. Otherwise, her hat and her shoes for motoring are those she wears calling, to afternoon teas and so on. But coats seem to be of thought-producing concern to the designer, who sees to it that the coat primarily for motoring leaves nothing to be desired.

Coats in general vary greatly just now. One is not quite certain that it is possible to pick out a coat and say, "Lo! the style." For all sorts of contradictory displays insist that two coats need not be consistent to be up-to-date. Take the length of coats, for instance. That ranges from hip to shoe tops. The longer coat, however, has the advantage of popularity, seemingly, over the shorter coat, and, of course, for the woman motorist it is the ideal length, giving as it does protection, warmth and comfort without the loss of good appearance.

The bizarre, or fantastical, has nothing to do with setting aside the motoring coat, but there is a more or less common standard according to which such is warmer and more roomy than the coat for wear about town.

A few weeks ago Motor Age showed two advance fall style coats that were representative of the new season in motoring coats and its tendencies. This coat shows the further development of these tendencies. It is of brown wool velour, the premier material this year, and combines many new features, such as those of the belt across the front only, the full-flare back and the collar buttoned high, yet loose enough for comfort when turning the head.

A word about velour, this fabric which has so gradually crept into the popular affections of the public. It is more pliable than velvet and lends itself to the same purposes. Hats, dresses and coats are made



of it this season, and the results are highly pleasing. Hats of this textile remind one of the beaver, which also has had its season of universal popularity.

Velour is not the only goods on the counter, however. Broadcloths, gabardines, serges, homespun, zibelines, beaver and seal coatings, caracul cloth; they, too, have their innings in the new fabrics of wool that claim to interpret the trend of this season's vogue.

In the style shown here the woman motorist can find a coat suitable for all occasions. It is a becoming coat, buttoned high and swinging from the shoulders, and whether she is middle-aged or still in her teens, there is no reason why she should not find it suitable for her own use. It is not a coat with an age, even though it is shown on a young woman. And its light weight and soft texture make it exceedingly acceptable for the elderly woman who wants a coat which is warm without being stiff or heavy.

The color, brown, is a pleasant color, especially so in the red and brown month of October, which so soon is to follow its display. It is the kind of coat one logically associates with October and October nutting parties to the woods in the car.

Rich browns have no superior this fall, but hold their own with the new plum shades, soft grays, deep wines and standard blue. Brown is the most happy of them all. For it has neither youth nor age limitations, is neither loud nor dull, cannot be accused of being too hot or too cold in color and is not so difficult to wear as the extremes of the gay, bright colors of the year and the black and white discords of earlier vogue.

Many an afternoon coat would have a motor taboo, but this motoring coat, as you can easily see, has no taboo of any kind and there is no reason to believe it need follow in the neighborhood of the exhaust of a gasoline engine always. The town electric, the shopping trip, the afternoon visitor—all may know it; the possibilities are boundless.

Shown by the Garment Specialty Co., New York

Travel opens the way for its wearing by any woman whose senses it pleases. It is as fit for traveling as for motoring. The two activities are interwoven to a certain extent, anyway. To motor is to travel.

The latest fashion dictate puts the skirt length down to the ankle, and the coat length already has shown a propensity to follow the skirt's lead. The three-quarters length still will be popular, though the hem-length coat promises to run it a close race for public favor.

This model has the hem-length. The button effect is also new, containing in it the military influence which is bringing into notice the Russian blouse and coat with the side closing again. It is almost too early to say the Russian influence is to strongly affect the coat, but the war atmosphere must have some finger in the fashion pie, no matter how far it is, as long as the war lasts, and the high military-effect collar is side by side with the newer collar, which stands out from the neck and is wide in the extreme, even so far sometimes that it can be called a ripple cape.

Color Comes to Car and Woods Alike

The calendar tells us that we now have had a week of fall—fall with its blaze of color and foretaste of Indian summer with its blue haze of witchery the first frost begins, and that sting in the air just sharp enough to make one want to be up and doing.

On the face of it, fall seems dead and lack-luster. Out on the road with the car going smoothly and the trees on each side, such is not true. The woods are saturated with color. The shade trees in the yard and in the park and on the shaded boulevard give out new tones and new shades to match the blue of the sky and the yellow of the sun.

Somehow—there seems no reason until you really think it over—the sky seems bluer and the sun seems brighter and the green that remains seems greener when fall begins. It must be because the dry of summer and the heat of summer has sort of wilted trees and grass and folks so all the outdoor colors turned to drab and nothing seems bright along the road.

Then comes the autumn color and the car takes a new lease on life. In the city the parks seem greener. Was it last month they looked so dead and you wondered if fall had come so early when summer was not half over? In the town the trees have got new life. School has been going on just a few weeks and the school children now find the first "turned" leaves, which already have absorbed some of the new colors.

Down in the Middle West, about the center of the map we studied when we had United States "jography," violets start to blooming out now just like spring. Then there are violet colors with the faint pinks

Beauty Hints for the Woman Motorist



No. 7

THE charming Billie Burke, whose most recent fame is that of "Gloria's Romance," once said that she advised the eyebrow pencil as a means of darkening the hair about the eyes, but she took pains to explain her statement, believing, no doubt, that there is a place for everything, even beauty aids. It is all right to use the eyebrow pencil because it will darken the hair about the eyes permanently if its use is persisted in. But—and here is where Billy Burke also limited its use—it should be "worn only in the seclusion of one's own company." Like the toothpick, it should be unseen, and perhaps unused.

When we were young, burnt matches were more in vogue than the eyebrow pencil. But burnt matches do little good unless your eyebrows are naturally dark, as any child can tell you. The charcoal sticks so that abstinence is a compulsory virtue even when you know that so many charm-endowed women are supposed to have smutty eyebrows.

Forbidden the eyebrow pencil as not the best vogue and the burnt match as without sponsor, the vaseline bottle is next, though it, too, is for use sub rosa. Vaseline is a very simple stimulant of the eyebrows. The effects are not appreciable for some time, but they are certain in the end. Brushing is decidedly advisable. These simple methods, however, are about all that one should attempt to do alone. If there is any serious trouble or any serious desire to change the natural growth the best thing to do is to consult someone accustomed to dealing with such matters, a beauty specialist or a physician in cases which threaten to weaken the eyes through inflammation from wild hairs.

and the red and the russets and the rich, soft browns which grow on trees just as in the shop windows of the new season.

Autumn color harmonizes, makes the rider in the car wonder if clothes and car do, or if something should be done to make them. If it's the old stand-by touring car with its black of body and cushions, why it doesn't matter so much. But if you have gone and picked out a bright green imp or a yellow streak or a red blaze, then there is room for thought.

Might be futuristic art to wear a bright blue dress or coat in a yellow car, but that's most too conspicuous for the average

car owner to desire. The browns and weak-toned reds do not go so well, either. If the car is yellow, it must have the center of the stage with neutral colors for its occupants, neutral in tone if not in color. Yellow is possible. Brown is possible. Even red is. But they call for care in selection. They cannot be taken lightly.

Taken with the fabrics they are wearing this fall, the colors are versatile enough for any car. If one leaned that way, a summary at this time might be thus: Coral pink satin glacé with silver; sand colored cloth with cool pinks that shiver; billows of dead-leaf faillé; red, red coler in all its glowing; billiard-green, new, delicious and flowing; red wool Jersey cloth and dull blue; again dull blue and pink tones faded low; then rose-colored taffeta quick to show autumn's colors rivalry; beige broadcloth and then nut-brown velvet; blue ratine and then gray velvet; all blend in multi-colored clash.

In short, the avenues and streets, as well as the woods, are full of color these days.

Should Car Be Setting for Motoring Car?

Speaking of color, one might continue, how about color in its relation to the personality of a car? Must the car subordinate its individuality in color to the dress of those who use it?

Harsh colors of glaring red and dull, lifeless drabs are being tolerated less in the touring or town car, and it is because they are too individualistic, too striking and too predominating. Cars are made to blend with the general tone of the surroundings. If it has upholstery, the upholstery is selected with a view to the dress of the woman motorist. At all times it is subordinate, unobtrusive and wide in its possibilities of harmonizing with other colors.

Cars are to be upholstered in the highest pastel shades this season in some cases. It is a reflection of the pastel shades which are to be worn this season. When black and white stripes were in, the black and white upholstery reigned. Now that pastel colors are the colors of the hour, the pastel upholstery is first. Car bodies also may be of these brighter shades and tones. They harmonize more easily, have more in common.

The higher-priced car bodies have suede and fawn-colored sides; a few have patent leather mud guards. They are expensive, but are planned to match the owner's taste, so that the owner will not have to dress to match the car's taste.

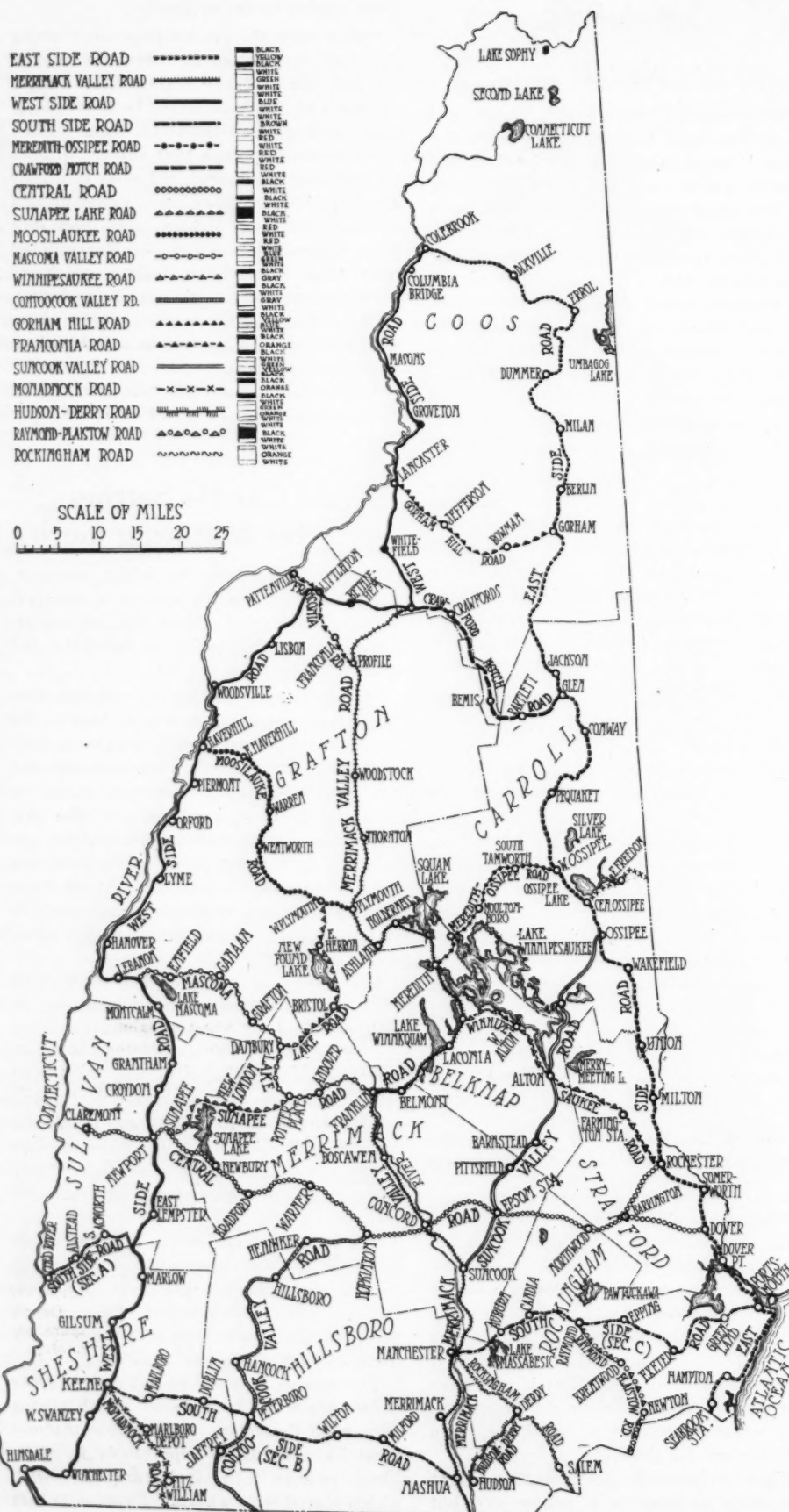
The makers of these personalities in car bodies claim to be able to match moods even with the color. A dark brown study must have a car to supplement it. The blues require a restful turquoise with nickel-plated wire wheels. Expense is left out; moods are luxuries.

Marked Roads of New Hampshire

How Through Routes
and Trunk Lines

of State Are Designated
by Bands of Color

By Frederick E. Everett, Commis-
sioner, State Highway
Department



SINCE the establishment of the highway department of the state of New Hampshire it has been the aim of all road legislation to create a system of through routes as well as to improve local highways. The first trunk lines determined upon and authorized were three routes from Massachusetts line to the White mountains known as the West Side, East Side and Merrimack Valley roads respectively. Later several other lines have been authorized following in general east-and-west routes and forming a network of trunk lines with these three.

However, until 1914, no attempt had been made to mark these routes for the benefit of motorists. At that time S. Percy Hooker, state highway commissioner, devised a system of colors and markings for the identification of the through routes by the traveling public. A different color was assigned to each of the then existing trunk lines, but as more routes have been authorized other colors or combinations of colors have been used.

The field markings are in the shape of bands painted on telephone poles or other roadside structures at intervals along the routes, especially where roads branch from the main line, three poles being banded on either side of the intersection. This gives the motorist a warning of an intersection before he arrives at it and enables him to follow the route without stopping to study guide boards. At all junctions of through routes guide signs are placed directing the motorist to follow certain colors to the more important towns along that particular route marked by those colors.

The accompanying map of the state of New Hampshire shows the routes already adopted and their respective markings.

ROADS POOR; INDICT TOWN

Bangor, Me., Sept. 22—Grand jury action for failure to provide good roads is new. At the meeting of the grand jury here an indictment was returned against the inhabitants of the town of Newburg for maintaining a stretch of road unsuitable for public travel. Newburg is about 15 miles south of Bangor and unless the town officials now get busy and improve the stretch of highway complained of, the municipality may be found guilty



Routes and Touring Information



Geneseo, Ill.—Mammoth Cave, Ky.

GENESEO, ILL.—Editor Motor Age—Advise the best route from Geneseo, Ill., to Mammoth Cave, Ky. Is there a good road in Kentucky running to the cave, or are we apt to find very poor roads in that vicinity?—W. F. Spencer.

In going from Geneseo to Mammoth Cave, Ky., we suggest that you go east through Atkinson, Sheffield, Princeton, Peru, La Salle, Ottawa, Morris, Dwight, Goodrich, Kankakee, Momence, Morocco, Goodland, Fowler, Attica, Crawfordsville, New Ross, Indianapolis, Franklin, Columbus, Seymour, Vallonia, Salem, Louisville, West Point, Elizabethtown, Upton, Woodsonville, Horse Cave, Cave City, to Mammoth Cave.

The roads will be in pretty good shape except possibly the last 10 or 15 miles just before Mammoth Cave, but this stretch is passable for cars, although the roads are of rather rough stone.

Volume 4 of the Automobile Blue Book will give you complete running directions for the trip.

Des Moines, Ia.—Greenwood, Wis.

NEW VIRGINIA, IA.—Editor Motor Age—Kindly give the best road from Des Moines, Ia., to Greenwood, Wis.—G. A. Jardine.

In going to Greenwood, Wis., we advise that you go north through Cambridge, Nevada, Hubbard, Iowa Falls, Hampton, Rockwell, Mason City, Northwood, Albert Lea, Austin, Racine, Chatfield, Saratoga, Enterprise, Ridgeway, La Crosse, then north through Holmen, Ettrick, Blair, Hixton, Neillsville, then to Greenwood.

Volumes 4 and 5 of the Automobile Blue Book will give you complete running directions for this trip.

Osage, Ia.—Rochester, Wis.

OSAGE, IA.—Editor Motor Age—Kindly give me best route from Osage, Ia., Mitchell county, to Rochester, Wis., Racine County.

What volume of the Automobile Blue Book would cover this, and where may it be purchased?—H. L. Woolverton.

In going from Osage, Ia. to Rochester, Wis., we advise that you go south through Orchard, Charles City, then east through Bassett, New Hampton, Williamstown, Fredericksburg, West Union, Postville, Luana, Froehlich, Girard, Prairie du Chien, Mt. Hope, Mt. Ida, Cobb, Dodgeville, Blue Mounds, Mt. Horeb, Pine Bluff, Madison, Ft. Atkinson, Whitewater, Millard, Elkhorn, Spring Prairie, Burlington, to Rochester.

Volume 5 of the Automobile Blue Book will give you complete running directions to Prairie du Chien, and Volume 4 will give you the directions from there to Rochester.

You can procure these volumes from the Automobile Blue Book Publishing Co., Malers Bldg., Chicago, or through your local dealer.

Lake Villa, Ill.—Miami, Fla.

LAKE VILLA, ILL.—Editor Motor Age—Kindly give the best route from Lake Villa, Ill., to Miami, Fla. Will it be possible to travel over the Dixie Highway?—P. A. Grady.

From Lake Villa, we advise you to go to Chicago. In going from Chicago to Miami, Fla., the best routing for you to follow is to go south through Thayer, Remington, Wolcott, La Fayette, Frankfort, Indianapolis, Columbus, Seymour, Salem, Louisville, West Point, Elizabethtown, Cave City, Glasgow, Springfield, Nashville, Murfreesboro, Manchester, Tracy City, Chattanooga, Rossville, Dalton, Cartersville, Atlanta, Griffin,

Barnesville, Macon, Perry, Hawkinsville, Waycross, Callahan, Jacksonville, St. Augustine, Hastings, Daytona, Titusville, Melbourne, Ft. Pierce, Palm Beach, Deerfield, Lauderdale, into Miami.

Volumes 4 and 6 of the Automobile Blue Book will give you a complete routing for this trip.

Chicago—Milwaukee

DECATUR, ILL.—Editor Motor Age—Kindly advise the best route between Chicago and Milwaukee.—G. J. Parke.

In going from Chicago to Milwaukee just now, the best routing to follow is to go north along Sheridan Road to Waukegan, then turn west on Belvidere St. for about 2.3 miles until you come to four corners with a schoolhouse on the right. Here turn right around the schoolhouse and go north on the Green Bay road to Milwaukee.

Volume 4 of the Automobile Blue Book will give you complete running directions for this trip.

Boone, Ia.—Los Angeles, Cal.

BOOKE, IA.—Editor Motor Age—We are contemplating a trip to Los Angeles, Cal., in October and wish to take the Lincoln Highway to Salt Lake City, from there on what route would Motor Age advise taking to Los Angeles, Cal., as we wish to avoid the deserts and do not want to go to San Francisco, therefore give us the best route out of Salt Lake City.

Would it be safe to undertake this trip in the month of October on account of the cold weather and snow.—Jons Auto Co.

In going to Los Angeles in a month from now you will find it better to go via the Santa Fe Trail into Los Angeles, because if you go into Salt Lake City you will encounter a little harder roads and the weather will be a little colder, and you will have to go over a desert whether you go down to San Francisco or to Los Angeles.

From Boone, go via Jefferson, Grand Junction, Carroll, Denison, Logan, to Omaha. From here either follow the O. L. D. Trail into Denver, then south to Pueblo and Santa Fe, or you can go from Omaha down to Topeka and Emporia, and pick up the Santa Fe Trail from there and follow that over to Pueblo and Santa Fe, then go west to Los Angeles, either via Phoenix or via the Grand Canyon you will have a much better trip at the time of the year you intend to go. Also you will find the scenery a great deal more attractive this way.

Volume 5 of the Automobile Blue Book will give you complete running directions for any of the ways you wish to go to Los Angeles.

Minot, N. D.—Dallas, Tex.

RUGBY, N. D.—Editor Motor Age—Kindly give the best route from Minot, N. D., to Dallas, Tex. Is the National Meridian Highway the best route?—S. F. Tarpley.

Leaving Minot, drive south through Greatstone, Maxwell, Alta, Bismarck, Glencoe, Linton, Mound City, Selby, then go east on the Yellowstone Trail, passing through Ipswich, Aberdeen, Webster, to Orley, and here turn south on the Meridian Road via Watertown, Salem, Freeman, Molan, Yankton, Pierce, Norfolk, Madison, Columbus, Stromsburg, York, Geneva, Hebron, Belleville, Concordia, Salina, McPherson, Newton, Wichita, Wellington, Enid, Kingfisher, El Reno, Anadarko, Lawton, Wichita Falls, Henrietta, Decatur, Fort Worth, then east through Arlington and Grand Prairie to Dallas.

Volume 5 of the Automobile Blue Book will give you complete running directions from Selby to Dallas.

Princeton, Ind.—Atlanta, Ga.

PRINCETON, IND.—Editor Motor Age—Kindly give the best route from Princeton, Ind., to Atlanta, Ga.—E. S. Robinson.

From Princeton, drive south through Warrenton, Evansville, then west to Howell, and south through Henderson, Cairo, Madisonville, Crofton, Hopkinsville, Clarksville. From here turn east to Springfield, and south to Nashville.

From Nashville to Chattanooga, we advise you to take the direct road through Murfreesboro, Hillsboro, Tracy City, Jasper, in dry weather, and would suggest going via Shelbyville, Fayetteville, Huntsville, Scottsboro, Trenton, Jasper, then to Chattanooga, in wet weather. We would advise your taking the East route via Chickamauga, Adairsville, Cartersville, and Marietta, to Atlanta.

Volumes 4 and 6 of the Automobile Blue Book will give you complete running directions for this trip.

Humboldt, Ia.—Los Angeles, Cal.

HUMBOLDT, IA.—Editor Motor Age—Kindly give the best route from Humboldt, Ia., to Los Angeles, Cal.—Bellows Bros.

In going to Los Angeles, there are two main routes that you can take. One is to go through Fort Dodge and Grand Junction then through Dennison to Omaha, then from there go West either over the O. L. D. Trail or the Lincoln Highway, to Denver; then south through Colorado Springs, Pueblo and Santa Fe.

The other way is to go from Fort Dodge down to Des Moines, over the Inter-State Trail to Kansas City, there taking the Santa Fe Trail and going West through Pueblo and Santa Fe. From Santa Fe your route lies through Springerville, and from there you have the choice of two roads, one going through Phoenix, to Los Angeles, and the other going via the Grand Canyon out to Los Angeles. The northern route through the Grand Canyon has the big attraction of one of the wonders of the United States, while the southern route through Phoenix has slightly better road conditions.

Volume 5 of the Automobile Blue Book will give you complete running directions for either route.

Oskaloosa, Ia.—Winston-Salem, N. C.

OSKALOOSA, IA.—Editor Motor Age—I am expecting to make a trip to Winston-Salem, N. C., in October. Please advise the best route.—C. S. McCall.

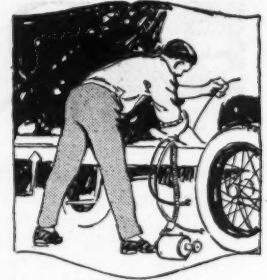
The best route for you to take to Winston-Salem, N. C., is to follow the Great White Way through Washington, Davenport, then down through Galesburg, Peoria, Bloomington, Champaign, Danville, Crawfordville, Indianapolis, Richmond, Dayton, Columbus, Newark, Hanover, Dresden, Coshocton, Port Washington, Uhrichsville, then go via Cadiz to Wheeling, where you pick up the National road via Elm Grove, Beallsville, Brownsville, Uniontown, Farmington, Addison, Grantsville, Cumberland, Hancock, Hagerstown, then go south through Winchester, Maurertown, Lacey Spring, to Staunton, and through Greenville, Fairfield, Lexington, Natural Bridge, to Roanoke. From Roanoke drive south through Rockmount, Martinsville, Madison, to Winston-Salem.

Volume 4 and 6 of the Automobile Blue Book will give you complete running directions for this trip.



Electrical Equipment of the Motor Car

By David Penn-Moreton & Darwin S. Hatch.



Editor's Note—Herewith is presented the thirteenth installment of a weekly series of articles which began in Motor Age issue of June 29, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.

WHAT HAS GONE BEFORE

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems and the relations of current pressure and resistance brought out. This was followed by an explanation of series and multiple circuits, and how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells were taken up and the best methods of connecting them. A separate section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and best methods of charging them. Magnets and electro-magnetism then were considered.

PART XIV—Generators and Motors

A DYNAMO is a machine for converting mechanical energy into electrical energy or electrical energy into mechanical energy by means of electromagnetic induction. The dynamo, when used to transform mechanical energy into electrical energy, is called a *generator*, and when it is used to transform electrical energy into mechanical energy, it is called a *motor*. Bear in mind that the generator does not create electricity, but simply imparts energy to it, just as energy is imparted to the electricity as it passes through the primary cell.

The dynamo consists, fundamentally, of two parts—a magnetic field, which may be produced by permanent magnets or electro-magnets, and an armature, which consists of a loop of wire or a number of loops, usually wound or mounted on an iron core or frame and so arranged that there may be a relative movement of the magnetic lines of force forming the magnetic field and the loop of wire. The movement of the loop of wire and the magnetic lines of force with respect to each other results in there being an electrical pressure produced in the loop.

Simple Alternator

If a single loop of wire is revolved in the magnetic field of a permanent magnet as shown in Fig. 103, there will be an electrical pressure induced in the two sides of the loop. If the terminals of the loop be connected to two metal rings C and D upon which brushes rest, this induced electrical pressure will produce a current in a circuit, such as a lamp, when it is connected to the brushes. The direction of the induced electrical pressure in the two sides of the loop may be determined by a simple application of Fleming's generator rule, as given in a previous installment.

The motion of one side of the loop with respect to the magnetic field is just the reverse to the motion of the other side. As a result of this difference in motion of the two sides of the loop with respect to the magnetic field, the electrical pressure induced in a side of the loop will be from the observer, while that induced in the other side will be toward the observer. These electrical pressures are in series and since their directions are opposite with respect to the observer, they both tend to produce a current in the same direction around the loop. There will be no induced electrical pressure in the ends of the loop since they cut no lines of force.

The electrical pressure induced in either side of the loop at any

instant will depend upon the number of magnetic lines cut in one second, or the rate at which the lines are being cut. This rate of cutting of the magnetic lines will depend upon the length of the two sides of the loop in the magnetic field, the strength of the magnetic field and the number of revolutions per second. Assuming the strength of the magnetic field is uniform, that it is the same at every part of the field and it remains constant in value, and the loop revolves about its axis at a constant speed,

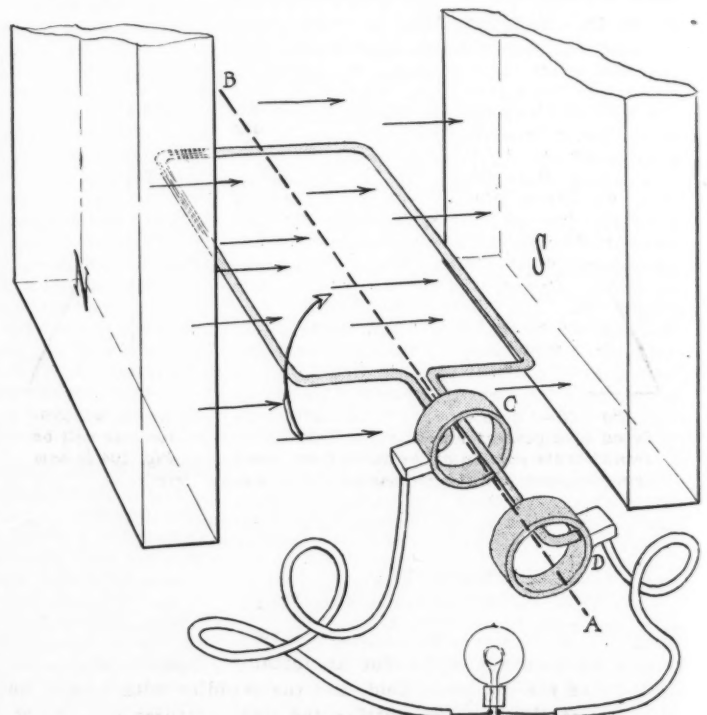


Fig. 103—The principle of the generator. This is the simplest alternating-current generator, in which a loop of wire is revolved about an axis A B in a magnetic field represented by the arrows passing between the poles N and S of a magnet. The induced current caused by the wire cutting the lines of force is taken off the collector rings C and D by brushes to which the outside circuit is connected.

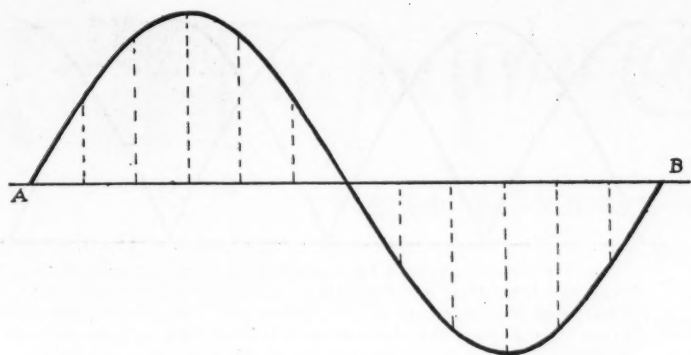


Fig. 104—Curve showing the variation of electrical pressure induced in a loop of wire when it is revolved in a magnetic field. This represents a complete revolution of the loop, and it will be seen that the pressure increases from zero to a maximum during the first quarter, decreases to zero during the second, then changes in direction. This causes the alternating of the current

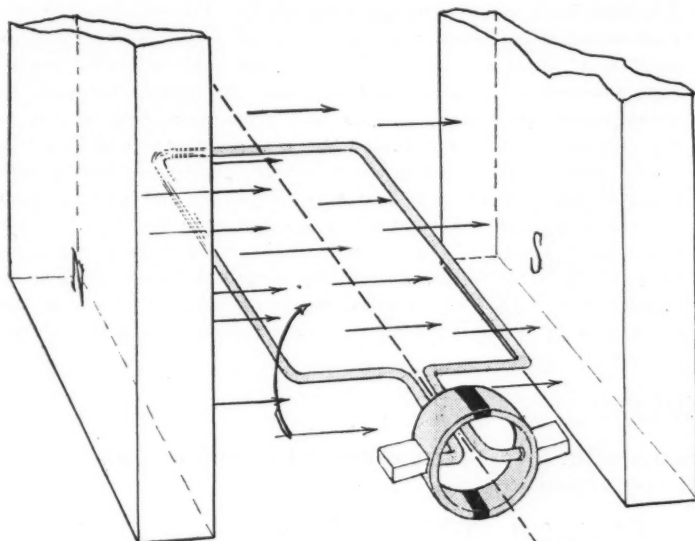


Fig. 105—Simplest direct-current generator—a single loop and a two-segment commutator

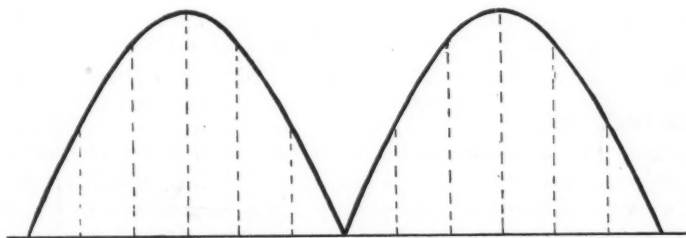


Fig. 106—Curve showing the variation in electrical pressure produced by a generator with a two-segment commutator. It will be seen that the portion of the curve below the line in Fig. 104 is now above the line, and the current all is in the same direction

then the induced pressure in the loop will change in value, due only to a change in the direction of motion of the two sides of the loop with respect to the magnetic field.

Thus, when the loop is in the horizontal position, the direction of the field also being horizontal, the two sides of the loop will be moving in a path, just for an instant, perpendicular to the direction of the magnetic field, and the rapidity with which the two sides of the loop are cutting the lines of force is greatest, hence the induced electrical pressure in the loop is zero for this position of the loop. The value of the induced electrical pressure for positions intermediate between those just given will depend upon how fast the sides of the loop are actually moving across the magnetic field.

A curve may be drawn which will show graphically the re-

lation between the induced electrical pressure in the loop and its position with respect to a plane perpendicular to the magnetic field. Draw a line A B, as in Fig. 104, and divide this line into, say, twelve equal parts; each part will then correspond to 30 degrees movement of the coil or loop about its axis. Start with the coil in a plane perpendicular to the magnetic field, and let this correspond to the point A in the figure; the electrical pressure induced in the loop for any movement from this position should be measured off to a convenient scale on a perpendicular line drawn through the point on A B, corresponding to the displacement of the loop. Thus, the electrical pressure will be a maximum when the loop has rotated through an angle of 90 degrees. It then decreases as the angle increases from 90 degrees to 180 degrees and becomes equal to zero when the loop has rotated through an angle of 180 degrees. The direction of the movement of the two sides of the loop with respect to the magnetic field changes just as the coil passes the 180-degree position and, as a result, the direction of the induced electrical pressure changes. The numerical values of the reduced pressure for the second 180 degrees are identical to those for the first 180 degrees, but they act around the loop in the opposite direction and are said to be opposite in sign. The difference in the sign is represented in the curve by drawing the second part of the curve below the horizontal line.

Such a curve represents the change in pressure of a simple alternating current generator.

Simple Direct-Current Generator

The electrical pressure induced in the loop of wire described in the previous section may be made to produce a direct current—one that is constant in direction in the external circuit in the following way: Suppose the two continuous metallic rings be replaced by a single ring composed of two parts that are insulated from each other, the distance between the ends of the two parts composing the ring being small in comparison to the total circumference of the combined ring. If the two ends of the loop be connected to these two parts of the ring, which are called segments, and two brushes that are insulated from each other be so mounted with respect to each other that they rest upon the insulation between the segments when the induced electrical pressure in the loop is zero, the connection of the external circuit with respect to the loop will be reversed at the same instant the direction of the induced electrical pressure in the loop changes. This results in the induced electrical pressure in the loop always tending to send a current through the external circuit in the same direction.

The proper arrangement of loop, segments and brushes is shown diagrammatically in Fig. 105. Such a machine constitutes a simple direct-current generator, because it delivers a current to the external circuit in one direction. The two-part ring constitutes a simple commutator of two segments and its purpose, as pointed out, is to reverse the connection of the external circuit with respect to armature winding, or vice versa, so that the induced electrical pressure in the winding will send a direct current through the external circuit. A curve showing the variation in the electrical pressure between the two brushes on a two-segment commutator is shown in Fig. 106. An electrical pressure such as that represented in Fig. 106 is called a *pulsating* electrical pressure, because it pulsates or changes from zero to a maximum and back to zero at regular intervals, but does not change in direction.

Four-Segment Commutator

If the armature of a direct-current generator were constructed with a single loop of wire composed of one or more turns, the current delivered by such a machine would pulsate in value the same as the induced electrical pressure, as shown in Fig. 106. The operation of such a machine would be very unsatisfactory in a great many cases, especially in charging storage batteries. Fortunately, the electrical pressure between the brushes of the machine can be made to remain more nearly constant in value in the following manner:

Suppose two loops of wire are used instead of one and that the ring is split into four parts instead of two and the brushes placed diametrically opposite each other and in such a position that the insulation passes under them when the loops each make an angle

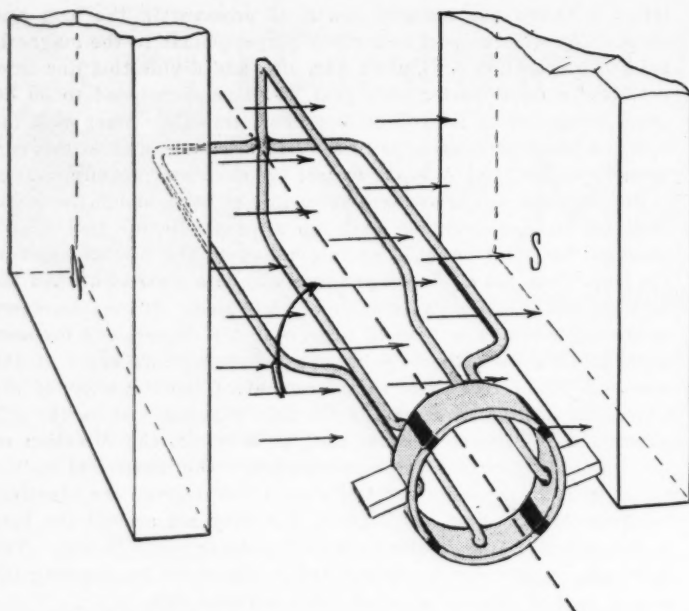


Fig. 107—A direct-current generator having two loops of wire and four segments in the commutator. This makes the pressure more even as indicated in Fig. 108. When the pressure in one loop is zero, the pressure in the other loop is greatest, so that the pressure is more nearly uniform than is the case with one loop only

of 45 degrees with the magnetic field. The arrangement of loops, segments and brushes is shown in Fig 107. The induced electrical pressure in the two loops passes through a series of values similar to those represented by the curve in Fig. 104, but the induced pressure in one is greatest when the induced pressure in the other loop is zero. When the brushes are in the position shown in Fig.

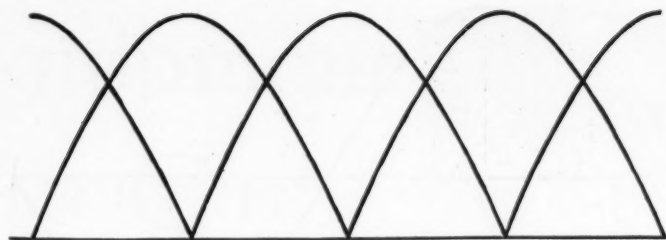


Fig. 108—Curve showing the variation in electrical pressure between the brushes of a direct-current generator having two loops of wire and four segments in the commutator. When the pressure in one loop is zero, the pressure in the other loop is greatest, so that the pressure is more nearly uniform than is the case with one loop only

107, the electrical pressure between the brushes does not drop to zero value for any position of the two loops, as the brushes are always in contact with segments which in turn are connected to the ends of a loop in which there is an induced electrical pressure. The two loops are alternately connected to the two brushes and each remains in circuit for one-fourth of a complete revolution each time. Each coil is connected and disconnected twice during each revolution. The pressure between the brushes for such an arrangement of coils, segments and brushes as that shown in Fig. 107 is shown by the shaded portion of the curves in Fig. 108.

The induced electrical pressure can be made more nearly constant by using more loops and more segments and placing them in such a position with respect to the first ones that the induced electrical pressure in the loops does not reach a zero maximum value at the same time it does in the others, and connecting them in such a way that the induced electrical pressure in all of the loops acts in series, parallel or series-parallel practically all of the time.

NEXT WEEK

The next installment of this series will explain armatures for direct-current generators and motors, also series, shunt and compound fields.

Sixth City Makes Rapid Progress

(Concluded from page 22)

matics for the manufacture of terminals, molts and other small parts entering into the battery. There are other gangs of presses to stap the handles of the battery boxes. On the boxes embossed lead name plates are now being used. These avoid corrosion.

The White Co. has been operating its factory on double shifts for the past 2 years. In its truck department it has had a great deal of European business and domestic trade has been exceptionally good during the past year. Factory additions are at present being carried out.

The Winton Co. has increased its output over 1915 and is still a month behind in orders. Its 48 model is now in its tenth year and model 33 in its third year; in other words, for 10 years the company has been a devotee of six-cylinder design. Practically the entire Winton output of cars is sold with different colors, color options being a part of every car sale. Thirty per cent of the output is sold with wire wheels. In all thirty-four different body styles are furnished, and 33 per cent of the business is closed winter jobs. Winter job business is one-half greater than a year ago. To take care of the various

colors for the different bodies a very complete battery of drying ovens has been made a part of the factory equipment.

The Stearns company is busy on its 1917

ROAD DENUNCIATION TOUR

Chicago, Sept. 26—A new type of motor tour in the interest of good roads took place today between Chicago and Milwaukee. It properly should be called a denunciation tour as its object is not to show how good the road is but how bad it is. The chief connecting link between Chicago and Milwaukee is Sheridan road upon which good roads organizations in this territory have been working for improvements for many years and today's run, arranged by the Sheridan Road Improvement Association of Illinois and Wisconsin, aims to arouse pride of lagging townships which to date have refused to co-operate in making the main avenue of travel good.

Approximately 1,000 cars were in the tour of protest which is divided into two parts: One, headed by Congressman G. E. Foss, of Illinois, started from Chicago and the other, led by Governor E. D. Philipp, left Milwaukee.

production. During the fiscal year, July 5 to July 5, 3,000 Stearns-Knight models were produced; 2,100 four-cylinders and 900 eights. The present factory schedule is 400 per month, divided equally between the two models. There are 1,400 men at present and since December 1, 10 months ago, the machine shop has been working three shifts per day. During the past year the factory has been enlarged by an assembly building 200 by 70 feet five stories, and of cement construction.

The Peerless company is at present engaged on its European order of trucks calling for seventy 4-ton trucks per week which order will carry the factory into the spring months. The factory employs 3,000 men and in addition to its truck business is producing fifty eight-cylinder passenger cars per week. Factory enlargements are planned for the near future and will include three new buildings, one will be for the exclusive manufacture of passenger cars and will have 150,000 square feet floor space.

Next week other Cleveland concerns engaged in the manufacture of motor cars, parts, etc., will be given as space does not permit it this week.



The Motor Car Repair Shop



Repair of Broken Wires and Terminals

By W. B. Blood

WHERE a short circuit is suspected, it may often be discovered by testing the ignition in the dark, especially in old models of cars where most of the wiring is open instead of passing through conduits. A spark will often be noticed passing from the defective point. The short is most liable to occur in the high tension circuit, that is, in connection with the wire leading from the coil to the spark plug; and the short should be looked for while the wire is in the position it generally occupies on the car, as the mere act of moving it in order to make the test above described may prevent the occurrence of the short from which it is suffering.

There is no economy in purchasing cheap insulating wire. The cost of tracing electrical troubles would soon buy more durable material. If, on examining the wire, it is found that parts of it are chafed, they should be carefully bound with insulating tape and the wire should be fastened so that further chafing is prevented. In making such a repair, make it permanent. It is better to spend a little more time in the first repair and have it lasting than to have to do the job over repeatedly. Rubber tubing or loom slipped over the wire at the defective spot is often a good repair.

The wires should be kept free from oil as oil rots the insulation and this invites shorts. If the insulation appears sound all the way through the trouble may be that the wire itself has become broken within the insulation. This is a frequent occurrence, especially when the wire is sharply bent. If the wire be pulled through the fingers with a bending movement then the break should be easily felt. If this method is ineffective then the voltmeter will tell the tale. The battery, the suspected wire and voltmeter should be formed into a complete circuit. Some tension or twisting movement should be inflicted on the wire during the test. If there is current in the battery, or magneto if that is the form of ignition, but none will pass through the voltmeter, there is a break. The wire should be replaced by another if that is possible, but if no spare wire is available, the defective one should be cut in two at the faulty spot, the insulation peeled back for about an inch on each end of the place cut and the ends of the wire twisted together.

All channels through which electricity is supposed to pass should be thoroughly clean. Contacts should be scraped to a polish with a knife blade. Avoid using a knife to which you attach any amount of value as you will be very likely to make an accidental contact with both terminals at once, to the great detriment of the

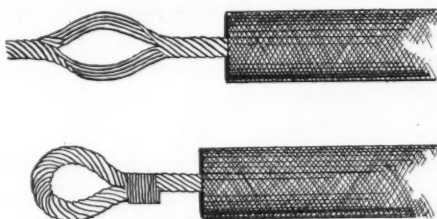


Fig. 1—A terminal made by untwisting the wire and opening the strands

Fig. 2—A loop terminal wrapped with fine wire

blade, not to mention the battery. To avoid corrosion the battery terminals should be bathed with a mixture of vaseline and ammonia.

There are a variety of terminals on the market. Some are good, some are bad. In soldering the wire to the terminal an acid flux should be avoided as this brings about corrosion and fracture. Resin is the best medium for soldering electric wires. Remember that soldering stiffens the wire. Care should be taken to keep the heat and the solder from the part of the wire outside the terminal which is liable to bend, as the heat and the solder will make it much more susceptible to breakage.

Suppose a terminal goes back on you out on the road and you have no other for replacement. An eye can be made of the wire. See Fig. 1. Untwist the wire a short distance from the end and separate

the straightened strands equally by pushing a sharp instrument in between, forming a hole sufficiently large to receive the screw terminal. A stronger eye may be made by baring an inch of the wire, see Fig. 2 and bending it into a simple loop, and then binding together with fine wire the two parts, that is the end against the part of the wire against which it is looped.

Another cause of intermittent firing is looseness of the platinum points on the trembler blade of the contact breaker. Dirty oil on the back of the blade around the platinum is generally an indication that the point is loose. The blade should be detached and laid face downward on a hard surface while the back of the point is riveted over with a light hammer.

The face of the platinum points should make square contact with each other. The passage of current and the everlasting tapping together of the two spoils the surfaces in the course of time. The usual remedy is to file the points flat with a thin watchmaker's file, or an ordinary steel fingernail file will work as well. Platinum is expensive and if waste, such as filing, can be avoided so much the better. If great care is taken the points may be hammered flat by light blows from a small hammer. The points may be cleaned by slipping a piece of calling card or strong paper between the points when they are open, closing the points and carefully withdrawing the cardboard or paper.

Manufacturers' Communications

"What Is Wrong With Racing?"

NEW YORK — Editor Motor Age — We have noticed with a good deal of interest your editorials headed "What Is Wrong With Racing?" Your continuous agitation of this subject is worthy of commendation, and we are glad of this opportunity to express our satisfaction with your methods in attempting to solve a difficult problem. Your suggestion in regard to a method for rewarding the drivers who continuously take part in races is a good one, but we would suggest further a more hearty interest in the champion motor car driver contest.

We recognized the value of the decision of the A. A. A. to attempt to select a champion motor car driver, and put up the Bosch cash prizes and the Bosch trophy to encourage this competition. The Goodrich

people followed us with a very liberal cash prize, and we had hoped to see other accessory firms come along and swell that cash prize, for it seems to us that if a good number of contests each year will be used to judge the champion motor car driver and a worth-while purse, in addition to the Bosch trophy is put up, every worth-while driver will get into as many contests as possible in order to get the greatest number of points for the list of prizes.

We think this plan probably is one of the best that could be arranged, and it might even be possible for the speedway people to donate a certain amount of money to swell the prize list and make the cash to be had for those who participate in all the races worth while.—Bosch Magneto Co.



The Readers' Clearing House

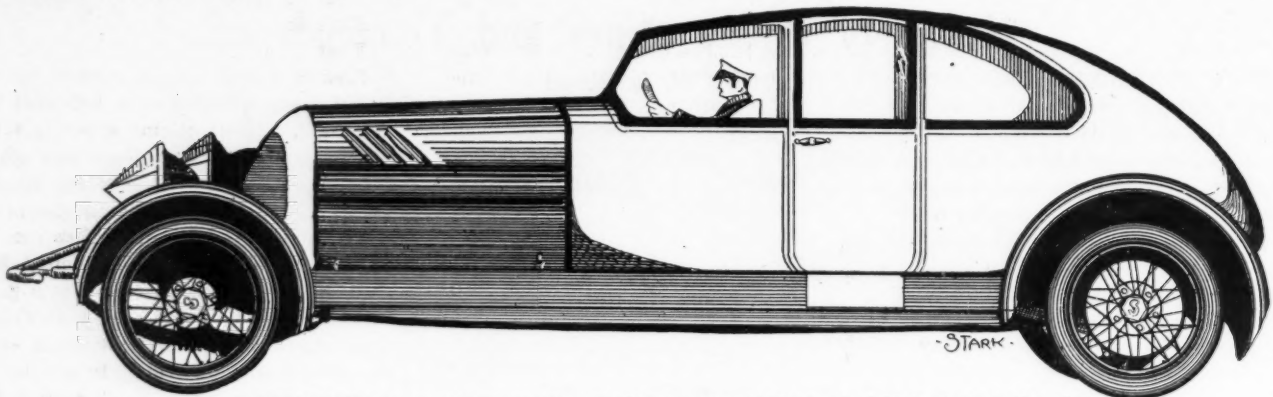


Fig. 1—Reader's idea of a modern sedan. In this drawing, if the car had 34 by 4 tires, the wheel-base would be 185 inches

Braking with the Clutch Engaged Brings More Readers' Comment

CHICAGO—Editor Motor Age—I have been advised that I should use the clutch as little as possible. For instance, when I want to slow up at a corner I should not throw out the clutch, but coast, applying the brake if necessary, but leave the clutch engaged and simply remove my foot entirely from the accelerator. The engine will thus, I am told, tend to slow up the car more rapidly than mere coasting would, and in the long run removing much wear from the brake and the clutch and saving gasoline used in disconnecting and connecting the clutch so often. One party even went so far as to advocate the use of the brake with the clutch engaged, the correct method, according to this person, being to disconnect the clutch only when coming to a full stop or so nearly a full stop that the speed lever must be returned to first and second speeds.

1—The use of the brake with the clutch engaged Motor Age already has discouraged, but how about the continual whipping back and forth of all the transmission mechanism when the engine is alternately used to drive the car and to retard the car? Is it not hard on the machine even when there is not much lost motion between the gear teeth, the sudden snap of pressure from one direction to the other?

2—And when the gear teeth are worn so that there is some lost motion between them, is not that sudden reversal of pressure dangerous, making the teeth pound against each other when the gas is suddenly taken from the motor?

3—It seems to me that a judicious use of the clutch when I want to slow up more rapidly than a gradual lessening of the pull of the engine, eliminates all sudden strains on the mechanism and is easier on every part of the car. The wear of the clutch ought not to be so great if I bring the moving parts of the clutch together when they are rotating at nearly the same speeds. Is that the correct principle of clutch operation?

4—In what position should the piston be when the explosion occurs, that is, how far past dead center?

5—Does the introduction of water vapor into the hot air pipe leading to the carburetor have any effect upon the formation of carbon in the cylinders?

6—Does it affect the force of the explosion of gasoline gas?

7—I have been told that it is helpful to the engine to get it hot and then pour kerosene into the auxiliary air inlet of the carburetor, with the engine running fast enough to suck it up with the gas, and then to pour water into the manifold or auxiliary air intake. It was claimed that the water, hitting the heated carbon would crack it off. Is this so, and would the water hurt the heated engine parts in any way?—W. L. Allen.

1—Evidently you have followed the discussion in the Readers' Clearing House and Repair Shop departments of Motor Age on the question of applying brakes with the clutch engaged and if you will think back you will remember that we stated, in the August 31 issue that there is a whipping

back and forth of the transmission mechanism when the motor is accelerated or retarded. The parts, however, are made to withstand this strain. Motor Age's one and only argument has been that it was harmful to apply the brakes VIGOROUSLY when the car has considerable momentum and the clutch is left in. It surely is hard on the gear teeth.

2—Yes. A loose bearing will always wear out quicker than a tight one. What is the principle of teeth against teeth, but the principle of bearings?

3—Your method is perfectly correct, IF YOU DO NOT SLAM ON THE BRAKES WHEN THE CLUTCH IS ENGAGED.

4—Depending on the particular timing of the motor. Generally from $\frac{1}{8}$ to $\frac{1}{4}$ below dead center.

5—It is said to loosen the carbon deposits and probably does if applied consistently.

6—The claim is that the power is increased.

7—The water will not hurt the engine parts, neither will the kerosene, and both are useful in removing carbon. There is the danger of getting water or kerosene mixed with the lubricating oil so impairing its lubricating qualities that it will harm the motor. It is not advisable to pour water into the manifold. Some of it is going back into the carburetor, and gasoline and water do not mix. Steam is a different proposition because it will enter the cylinder as a vapor.

AGAIN — THE BRAKING QUESTION Reader Tells How He Can Perform the Operation Sans Harm

Pittsburgh, Pa.—Editor Motor Age—On a hard, level surface with brakes in perfect order, in direct gear, and with throttle at a point B, my car travels 15 miles per hour; ascends a certain grade at 10 miles per hour, or descends at 22 miles per hour. Under the following conditions, these facts are evident:

1—Descending with clutch engaged at 22 miles per hour, car is running the engine.

2—Retarding with the brakes to approximately 18 miles per hour, the engine is neutralized, or nearly so.

3—Retarding the speed with the brakes to 15 miles per hour imposes an unnecessary wear on the brakes and the same strain on the transmission and engine members that is imposed when running 15 miles per hour on the level.

4—Retarding the speed with the brakes to 10 miles per hour imposes the same strain on the engine and transmission members as ascending the grade, which is unnecessary and undue. This is known locally as braking below the normal engine speed and the sum and substance of the whole matter may be expressed. "Do not brake with clutch engaged below the normal engine speed," the term normal engine speed being the speed which the car will travel on the level with that certain throttle opening.

My reasoning is at variance with the article of August 31. I may be wrong, but there is enough debate on this question to make it worthy of an engineer's article, illustrated with diagrams of the foregoing or similar running examples. As a constant reader of Motor Age, and particularly this department, I find that I am not alone in being a reader who desires to know not merely a fact, but also wants to know why it is a fact. If my deductions, as above stated, are not logical, I would respectfully ask, why?—J. E. Boobyer.

Let us take exception to your statement

Communications Received and Inquiries Received

W. L. Allen.....Chicago
J. E. Boobyer.....Pittsburgh, Pa.
Peter Espenschied.....Mt. Vernon, Ind.
R. W. Daggett, Jr.....Madison, Wis.
Vernon Steffon.....Dike, Ia.
J. S. B.....West Point, Ga.
Linden L. Stark.....Chicago
A Reader.....Milwaukee, Wis.
Duane A. Fellows.....Portland, Ore.
C. J. Rohlfing.....Bellflower, Ill.
L. L. Walker.....Hicksville, O.
Dick Jolly.....Oklahoma City, Okla.
W. H. K.....Louisville, Ky.
Ralph Wiegert.....Paola, Kan.
H. I. Lea.....Cookville, Tenn.
Floyd Dement.....Bend, Ore.
G. W. Havers.....Dayton, O.
Morley Wilkins.....Rochester, Minn.
G. C. Patton.....Chester, S. D.
R. J. Godbey.....Memphis, Tenn.
Subscriber.....Lincoln, Neb.
A Subscriber.....Burlington, Ia.
Howard Krueger.....Blue Island, Ill.

No communication not signed by the inquirer's full name and address will be answered in this department.

that your reasoning is at variance with the Motor Age article of August 31. That article, together with all other statements made by Motor Age on the subject of braking with the clutch engaged made one stand and one stand only and that is that IT IS HARMFUL TO APPLY THE BRAKES VIROROUSLY WHEN THE CAR IS UNDER GOOD MOMENTUM AND THE CLUTCH IS ENGAGED. You are perfectly right in the statements you have made. We contend that we are right in ours. It is possible to brake with the clutch engaged if conditions are right, and not harm anything. We drew a comparison in a previous answer that a man may fall out of a six-story window, and, if conditions are right, if there is something to break his fall, he is going to live; but what man will jump out of a six-story window to find out whether he will live or whether he will not? An article with diagrams as you suggest, will appear in a future issue of Motor Age.

Overland Specifications

Mount Vernon, Ind.—Editor Motor Age—Please let me know the weight of the Overland six, also the horsepower. What kind of rear axle, what kind of motor and the gearset location. I refer to the new Overland which sells for \$925.—Peter Espenschied.

The model 86 Overland weighs, equipped for touring 3,466 pounds. Shipping weight is 3,296 pounds. It has a full floating rear axle, L-head motor with valves on the right side and the gearset is a selective three-speed type in unit with the motor.

Dr. Duff's Winning Mercer

Milwaukee, Wis.—Editor Motor Age—Please state the gear ratio of Dr. Duff's Mercer run about that made the record lap at the rate of 94 miles per hour at the Chicago amateurs' race. Is this the stock gear ratio?

2—What other changes were made on the car to get such speed from it?—A Reader.

1—The gear ratio was 2 $\frac{1}{2}$ to 1, which is the stock ratio as furnished by the factory for all speedsters.

2—A special Rayfield carburetor was used, a duplicate to the one used by Eddie Pullen on all of his Mercer racing jobs. Double valve springs also were used. Otherwise no changes were made.

Howling in Rear Axle

Madison, Wis.—Editor Motor Age—Advise me of a remedy for howling in the rear axle of a new 1916 model. I understand there is some means of tapping the torsion tube which will stop this howling.—R. W. Daggett, Jr.

Howling in the rear axle is due to improper adjustment of the ring gear and bevel pinion, or, rarely, to improper cutting of the gears. As you do not give the name of your car we can offer no suggestions for adjustment. We do not know what you mean by tapping the torsion tube. It is our suggestion that, if the car is still within the guarantee, you take up your trouble with the manufacturers or nearest service station.

How to Become a Mechanic

New York City—Editor Motor Age—Having noted several inquiries in the Readers' Clearing House of Motor Age from young men asking how they should go about it to become a race mechanic, let me give a tip from my own experience

for their possible enlightenment. The big thing is getting a driver interested in you and getting a tryout. I was a garage repairman in a large city and had a nose for racing. A big race meet was scheduled for a track in that city and one of the drivers brought his car into our garage. His oil pump was proving stubborn. I made a new leather plunger for him without his knowing anything about it, and when it was finished showed him the repaired job. He gave me a ride, asked me a few questions and gave me a job. I have pumped oil ever since. It is largely a matter of luck.—E. J. B.

POWER CURVE OF NATIONAL 12 Squeaking and Rattling in Wheels Due to Loose Spokes

Dike, Ia.—Editor Motor Age—Do Rickenbacher and Henderson still use kerosene as fuel in their Maxwells? Ans.—No.

2—What is the greatest speed ever attained by a motor car, when and by whom?

3—What is the power curve of the National twin six?

4—What are the advantages of the high speed and low speed motors?

5—Is there any way to stop the squeaking, cracking noise of wheels, and if so how, as it is very annoying.—Vernon Steffen.

2—142.9 miles per hour made by Duray in a 300 horsepower Fiat at Ostend, December 16, 1913.

3—The power curve will be found in Fig. 2.

4—For pleasure car use high speed motors; some of the advantages claimed are as follows: Possibility of using smaller bore, thus tending towards economy; lighter reciprocating parts and higher relative speed of these parts, thus reducing vibration; and smoother motor action at low speeds. More constant torque at low speeds creating a smoother acting motor.

5—Squeaking and cracking wheels can generally be laid to loose spokes. Tighten the bolts around the flanges which support the spokes.

GEAR RATIOS OF THE SUPER-SIX Carburetor of New Hudson Has Only One Adjustment

West Point, Ga.—Editor Motor Age—Please give the gear ratio on the Hudson super six in first, second, third and reverse.

2—The maximum engine speed r. p. m.

3—Show diagram and instructions as to how to adjust the carburetor on this car.

4—Please give maximum speed m. p. h., of Studebaker six, Buick D-45, D-55.—J. S. B.

1—The ratios through the gearset are as follows:

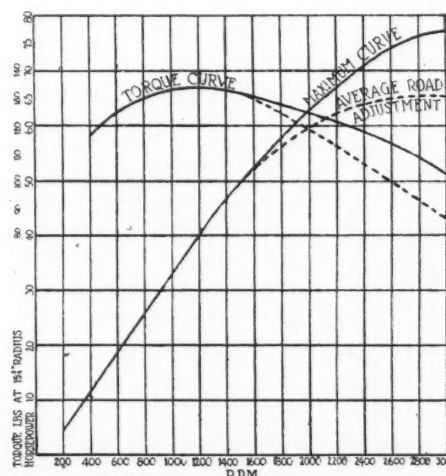


Fig. 2—Power curve of the National twelve

Reverse3.69 to 1
First3.00 to 1
Second1.80 to 1
Third1.00 to 1

The total reduction from the motor crankshaft to the rear wheel follows, this with the standard 4 5/11 to 1 ratio:

Reverse16.45 to 1
First13.38 to 1
Second8.03 to 1
Third4.45 to 1

2—The maximum engine speed is about 2,600 for the standard motor, although in some instances these motors have been run as high as 3,500 revolutions per minute.

3—The only possible adjustment is the raising and lowering of the gasoline feed regulator, see cross section in Fig. 3. This regulator is actuated by a small pinion attached on the outside to a lever which in turn is connected to a dash adjustment. By raising or lowering this sleeve, the equivalent of raising or lowering the height of the fuel in the float chamber is accomplished, although, of course, this remains at a constant height. At the same time more or less of the V slot in the metering pin is uncovered, allowing the richening or leaning of the mixture by the operator.

4—There are no definite figures available on either car.

SUBMARINE DESIGN OF SEDAN Reader Submits Plan of Car in Which He Fails to Observe Proportions

Chicago, Ill.—Editor Motor Age—I am sending under separate cover, a drawing made by myself, to illustrate my idea of a modern touring Sedan. [See Fig. 1.] The chassis is any standard one of a wheelbase long enough to fit the body, hood and radiator. The frame is of the deep-channel type very similar to the frame of the Marmon. Attached directly to the frame at their respective places are the fenders. There are no running boards. Access to the car is gained by means of a step, which upon the opening of the door, is automatically lowered, it fitting closely to the frame when not in use. This step is identical to those used on the Chicago surface cars. The radiator is V-shaped and the filler is underneath the hood. The headlights are standard, they being fitted with stream-line dimmers. The springs are semi-elliptic and cantilever. Extending under the entire length of the car is a metal pan, which is not only a protection to the various parts of the chassis, but also a fitting complement to the stream-line design. Of course, wire wheels are provided.

As for the body, it is low as compared with other bodies. The seats are low, yet tilted in such a manner as to give a comfortable position for its occupants. The back of the rear seat is almost directly above the front of the rear fender. In back of the rear seat is a compartment which is used for extra wheels and luggage. Access to this tail is gotten by means of a door which is large, yet fitting the contour of the body so perfectly that it is practically invisible. Due to the doors, the front seats are divided. There is plenty of head room for passengers sitting either in the front or rear seats. I would appreciate any criticisms on my design.—Linden L. Stark.

The design is certainly unique in its lines, but you have disregarded any observance of scale. Assuming that the wheels on the car you have drawn are equipped with 34-inch tires, then the wheelbase of the car would be approximately 185 inches.

Gear Ratios of Three Cars

Blue Island, Ill.—Editor Motor Age—Publish the gear ratio in first, second and third speeds of the following cars: Cunningham 8, Marmon 34 and Buick D 55.—Howard Krueger.

Cunningham, 4.08 on high, 7.2 on intermediate, 13.4 on low. Marmon, high, 3.69

to 1; intermediate, 6.01 to 1; low, 12.4 to 1. Buick, 3.77 to 1 on high, 6.14 to 1 on intermediate, and 12.7 to 1 on low.

WIRING FIXTURES TO A BRISCOE

Diagram and Explanation Showing How to Connect Ammeter and Searchlight

Portland, Ore.—Editor Motor Age—Please show me the wiring of 1916, four-cylinder Briscoe and where to connect an ammeter and spot light to fasten on windshield.—Duane A. Fellows.

Fig. 5 illustrates how to wire an ammeter and a windshield searchlight to a Briscoe 1916 4-38 model. The ammeter is wired to two points on the wire which runs from the starter switch to the cut-out switch. In other words the current on that wire passes through the ammeter. If, after you have completed the wiring you find that the ammeter shows discharge when it should show charge, the matter may be remedied by exchanging the wires on the back of the ammeter, one for the other. The searchlight, of course, is for a one-wire circuit. The wire is connected to the cutout switch as shown and the return current is grounded through the frame. To make this work successfully there must, of course, be a metal contact from the light through the windshield to the body and thence to the frame.

WANTS V-BELT FOR HIS CYCLECAR

Motor Loses Power After It Is Run a Short Distance

Chester, S. D.—Editor Motor Age—About 2 years ago I purchased a cycle car from the Auburn Motor Car Co. Can Motor Age advise where I can get a V-belt for one of the cars that will not break. The wire cables which are in the belt that came with the car will not hold.

2—The motor is a two-cylinder air-cooled and, after running about $\frac{1}{2}$ mile, loses its power entirely and sometimes will not run idle. It apparently does not overheat, at least the pistons do not stick. Can Motor Age give me any advice in regard to this?—G. C. Patton.

1—The Puritan Mach. Co., Detroit, Mich., advises us that it has a stock of good V-belt at \$1.75 per foot, but is not sure whether it will fit your car. We would suggest that you write this company on the matter.

2—Possibly the valves are adjusted too close and when the motor becomes heated expand sufficiently to keep them lifted from their seats. This is the only suggestion we could offer on the strength of the brief description you give of your troubles.

HIS FRONT CYLINDER MISFIRES

Gas May Not Be Getting Through Manifold Into No. 1 Cylinder

Hicksville, O.—Editor Motor Age—Am having trouble with a Flanders 20. When running slowly or downhill all four cylinders fire regularly, but as soon as I feed it any more gas or start up a small grade No. 1 cylinder begins to miss. Have put in new points on the contact breaker and tried several different kinds of spark plugs, also put in new non-leaking piston rings, but still No. 1 cylinder will not fire. What is the cause?—L. L. Walker.

Your description is not detailed enough to permit us to give a very thorough diagnosis. In fact, the trouble of cylinder misfiring is something that cannot be handled accurately by correspondence. We can only give a guess that the valves are not properly adjusted or that the carburetor

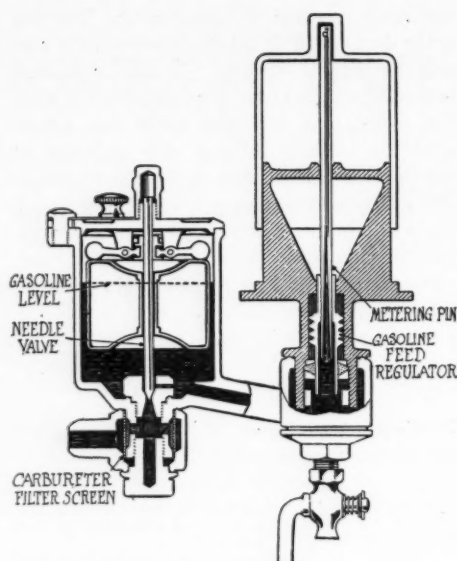


Fig. 3—Diagram illustrating carburetor adjustment on Hudson Super-Six

and manifold are not up-to-date enough to take care of the present low grade of gasoline. The No. 1 cylinder, being front, is better cooled than the other three and it is possible that the gas does not pass into it before some of it has condensed in the manifold. Try this. Soak a heavy towel in boiling hot water and wrap it around the front of the manifold immediately. Then drive your car before it has had time to cool, speeding it up and ascending grades. If the misfiring ceases our diagnosis is correct and the trouble can only be remedied by a new and modern carburetor, an intake manifold with a shorter standpipe, or possibly a combination of the two.

THERMO SYPHON VERSUS PUMP

Gear Ratio Effect of Large and Small Tires

Bellflower, Ill.—Editor Motor Age—Is the thermo siphon system of cooling as effective as the pump system?

2—What is the maximum speed of the Chalmers 7-22, seven-passenger model, on country roads?

3—Explain the difference between the Hotchkiss and the Hodgkiss drive?

4—Is a car geared 4 to 1 with 34 by 4-inch tires higher geared than one geared 4 to 1 with 32 by 4-inch tires? If not, please explain.—C. J. Rohlfing.

1—In certain types of motors, yes. It seems to be the practice to use thermosyphon in small motors and pump circulation in large ones.

2—In the neighborhood of 55 miles per hour.

3—There is no Hotchkiss drive to our knowledge. If you have read of such a thing it was probably a typographical error, or else the man who wrote the article did not know how to spell the name.

4—Yes. The larger the tire the higher the gearing. As an example of this principle, roll a golf ball and a tennis ball side by side at the same speed over a flat surface. The golf ball will rotate much faster than the tennis ball because its diameter is smaller. Looking at it another way, a 32-inch tire has a circumference of approximately 100 inches; a 34-inch tire has a circumference of approximately 107 inches. With both tires rotating at the same speed the larger one will travel approximately 7 inches farther than the smaller. In other words it takes less engine speed to drive the car a given distance with the large tire than it does with the small.

POWER APPLIED IN DIFFERENTIAL

Relative Speeds of Rotation of Wheels to That of Gear Housing

Oklahoma City, Okla.—Editor Motor Age—When a car turns a corner one wheel travels faster than the other. Is the power all in one wheel, or is there still an equal amount of power in both wheels, and if the power is all in one wheel while the car is turning the corner, in which of the wheels is the power?—Dick Jolly.

With both wheels getting traction there is power being delivered to both. The only effect is to change the relative speeds of the wheels. If, in turning a corner, the differential housing is revolving 200 revolutions per minute and the inside wheel on the turn is revolving 150, then the out-

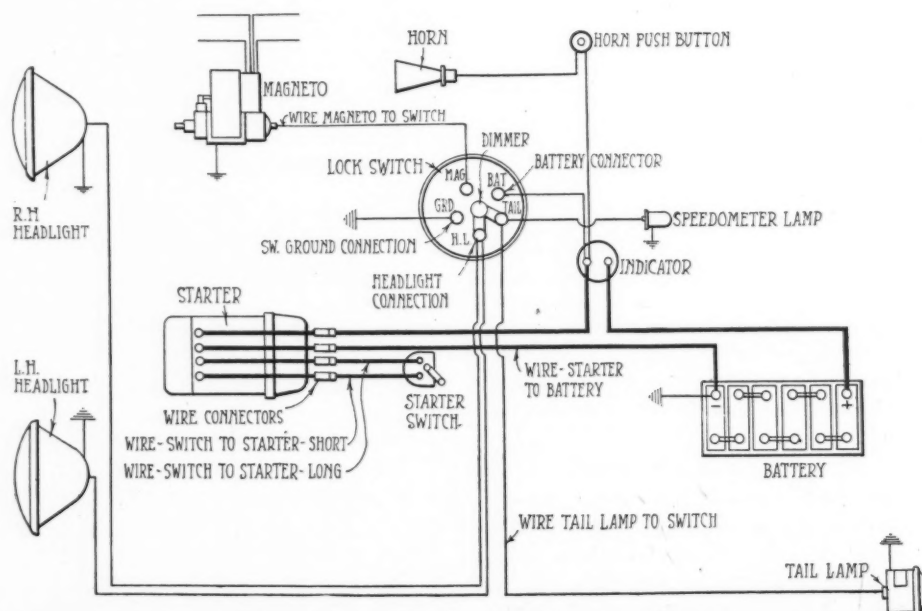


Fig. 4—Wiring diagram of North East system on Dodge

side wheel is turning a speed faster than the housing in direct relation with the speed slower that the inner wheel is turning, in other words it turns 250 revolutions per minute. Power is delivered to both wheels unless one wheel is entirely stationary, stuck in mud or sand, and the other wheel is then getting all the power and turning twice as fast as the differential housing. This assumes that the ordinary bevel gear differential is being discussed.

WHY A. A. A. BARS THE OUTLAWS Outlaws Do Not Fit Into the Scheme of Well-Regulated Rules

Paola, Kan.—Editor Motor Age—Why does the American Automobile Association bar racing drivers who are or have been outlaw drivers?
2—What speed will a stock model Maxwell make remodeled into a racing car?
3—On all racing cars I notice the engine sets back of the front axle. Is this to hang the weight between the axle or closer to the ground or track?—Ralph Wingert.

1—To discourage disregard of the power of the American Automobile Association in handling races. It is for the same reason that colleges bar athletes from their teams who have used their athletic prowess for money, and the same reason why an employe loses his job if he does not live up to the rules laid down by his employer. It maintains a precedent.

2—Depending entirely on the model of Maxwell.

3—This practice is no different than in pleasure cars. Motors hung over the front axle are few and far between.

CANNOT CONNECT HORN AND MAG Maximum Weight Advised by Tire Makers for 34-Inch Tires

Rochester, Minn.—Editor Motor Age—Is it possible to satisfactorily connect a 6-volt electric vibrator horn to a Splitdorf low-tension magneto?

2—What is the maximum weight that a 34 by 3½ tire should carry?
3—Is a car weighing 2,700 pounds empty too heavy for this size tire?—Morley Wilkins.

1—It cannot be done.

2—About 735 pounds per tire is the advised maximum. Tires of this size will handle heavier weights, however.

3—No.

Plates, Not Cell, Charged

Cookville, Tenn.—Editor Motor Age—When you take out a cell and put in separators and put in new acid that tests up to 1,300 before you put it in the battery, should you have to charge

the whole battery? One cell, or should you have to charge it at all?—H. I. Lea.

Charge the whole battery. It is the plates that need charging.

NAMES OF KNIGHT MOTORED CARS Overland Makes Motors—Argo Now Is the Hackett

Dayton, O.—Editor Motor Age—Has the manufacture of the Argo car been discontinued?

2—Who makes the motors used in all models of the Overland?

3—Kindly publish a photograph and give the specifications of the Emerson car?

4—Is there a car made in Lima, O., known as the Lima light car?

5—Give the names of all the Knight motored cars now being manufactured.—G. W. Havers.

The new model Argo car is known as the Hackett four. It is built in the same factory in which the Argo was built with a slight change in management.

2—Overland.

3—We have neither photographs nor specifications of the Emerson car available.

4—There was a Lima Light Car Co., Lima, O., in 1915, but no reports have been received concerning the existence of such a company, recently.

5—Moline-Knight, Stearns-Knight and Willys-Knight.

PATHFINDER HIGH GEAR RECORD Reverse Not Used to Back Car Up Steep Mountain Grades

Lincoln, Neb.—Editor Motor Age—The manufacturers of the Pathfinder car announce that one of their cars recently made the trip from the Pacific to the Atlantic coast on high gear; that the transmission case contained only the high and reverse gear. What I wish to know is:

1—In order to make a strictly bona fide test of this nature should not the gear ratio of the high and reverse gears be the same?

2—In the Pathfinder car making this trip what was the gear ratio on high between motor and rear wheel; and what was the gear ratio on reverse?—Subscriber.

1—The car would be special and not standard production in this case. Both the Pathfinder drivers assert that never was the car reversed to climb a grade. On the most famous grades they had an audience.

2—On high, 4.3 to 1; on reverse, 18.53 to 1.

REASON WHY TIRES MAKE NOISE Hum Is Friction Noise Caused by Contact of Rough Surfaces

Memphis, Tenn.—Editor Motor Age—Why do some tires hum when running? I thought it was Pennsylvania Vacuum's at first, but have heard plain treads, Nobby treads and in fact

Silvertowns. I suppose it is due to the fact that at a certain air pressure all tires make the same noise. Sometimes they make the noise and the next day they do not, then the next day they will make the same noise. It is not only on wet streets but on dry ones as well.—R. J. Godbey.

It is generally the non-skid tires that hum. It is a frictional noise caused by rapid contact of the rough surface of the tire onto the road. A hard tire will generally make more noise than a soft one because there is no give to the surfaces to reduce the noise. Roll a golf ball over a piece of glass. It makes a similar noise and for the same cause.

ELECTRICAL SYSTEM OF THE DODGE Lighting By One-Wire System, Starting By Two-Wire Plan

Louisville, Ky.—Editor Motor Age—Will you please publish complete wire diagram of 1917 model Dodge car?

2—What starting and lighting system do they use?

3—Give full explanation regarding starting, lighting and ignition system of this car.—W. H. K.

1—We are publishing a wiring diagram of the Dodge car in Fig. 4. You speak of the 1917 model. Dodge does not designate its cars by yearly models. In the diagram shown you will note that the lighting system is grounded, but the starting system is not.

2—North East Electric Co.

3—The lighting system is one wire, the return current being grounded through the frame. The starter-generator has two wire connections. One switch group controls the lighting and ignition although the ignition, which is by magneto, is an entirely separate unit from the battery system which includes starting and lighting. Otherwise the system is very conventional. Current from the starter-generator charges the battery and is fed from the battery through the indicator to the switch, where it is distributed to the lights and horn. The generator becomes a motor by application of the starter switch, drawing current from the battery to start the motor instead of charging it.

Injecting Steam in Manifold

Bend, Ore.—Editor Motor Age—Does the injection of steam into the intake manifold from the water-cooling system act effectively as a decarbonizer for motor car engines? It is said this method is used in the Deisel engines.—Floyd Dement.

It is said to, although in this office we have no records of accurate tests which would bear out the claim. There are several devices on the market to perform this act in motor car engines.

Reports of experiments tends to show that the injection of steam or water vapor into the cylinders does tend to loosen up carbon deposits and prevent the formation of carbon.

Cole Eight Gear Ratios

Phoenix, Ariz.—Editor Motor Age—What are the gear ratios in the three forward speeds and reverse in the Cole 1916 eight-cylinder car?—E. J. D.

The ratio is direct in third. Second is 1.76 to 1 and low 3.36 to 1. Reverse is 4.32 to 1. To find the ratio to the rear wheels multiply the differential ratio by the above figures.

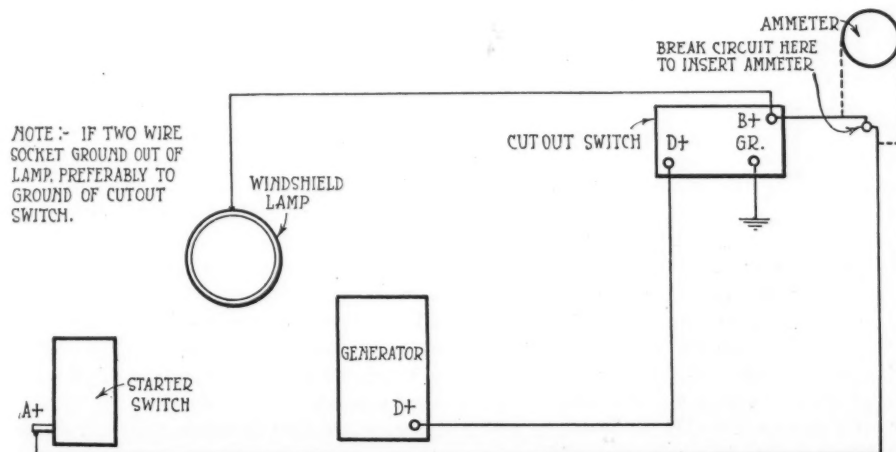
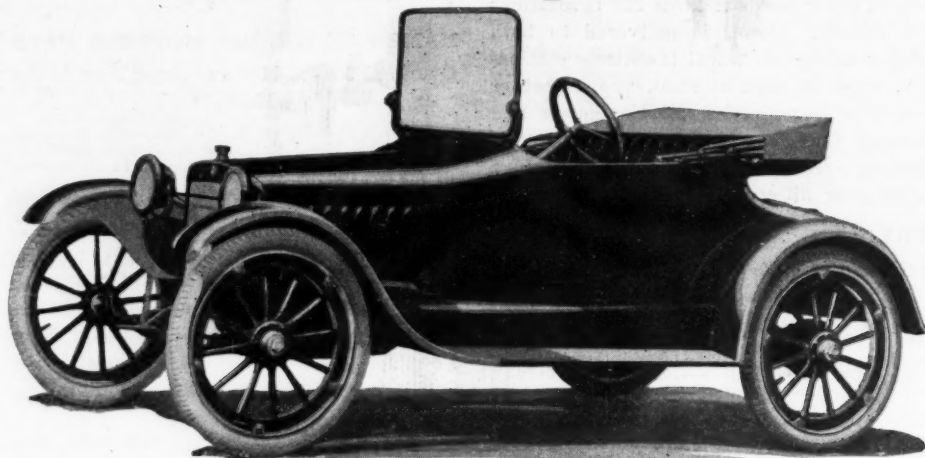


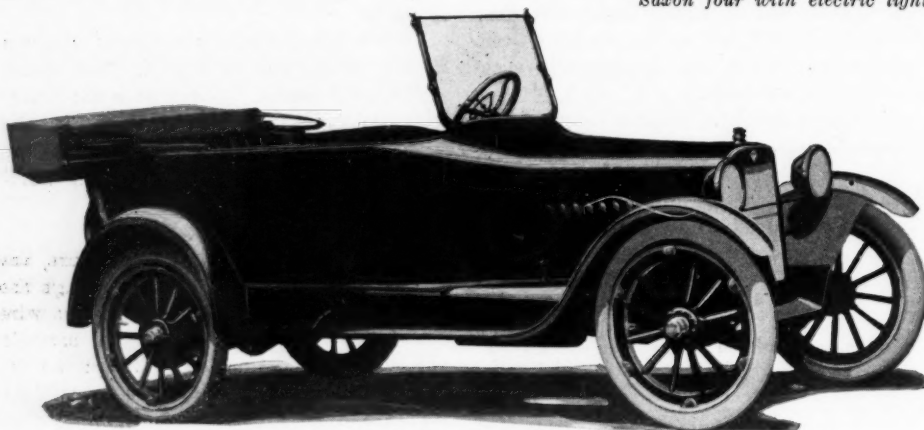
Fig. 5—Wiring of ammeter and searchlight to Briscoe 4-38

Saxon Six and Four Improved

Small Car Now Has Complete Equipment and Many Refinements
—New Lines



Saxon four with electric lights and starter as regular equipment



The new Saxon six—a more comfortable and luxurious car than the car of 1916 production

MUCH improved over the previous series are the new Saxon six and the little four-cylinder roadster. Refinements both in the mechanical details of the powerplants and chassis, and some important body changes make the cars better buys than ever, the six remaining at \$815, and the roadster selling in its new form for \$495.

In this four-cylinder roadster model, which was the first type of car to bring the Saxon name into prominence, the equipment has been materially increased, and the body revamped in most commendatory fashion. It is true that the cost of the roadster has been increased, and while on the face of it, it would appear that \$100 has been added to the price, it is really more of a value than heretofore, when the added features are taken into consideration.

Electric Equipment on Tour

In the new series, this model is supplied only with full electrical equipment, including a two-unit Wagner starting and lighting system and electric head and rear lamps. Then, too, the size of the tires has been increased from 28 by 3 inches on Q-D rims to 30 by 3 Goodyears on demountable rims. These two important equipment additions, together with an electric horn and speedometer, lift the little Saxon to an equal plane with most other cars in the

matter of completeness. Last year a starter was furnished for this model at an additional cost of \$50, bringing the total then to \$445, and when this is considered, the new price, with every modern feature and a number of refinements to be mentioned later, looks low indeed.

The six is a decidedly better looking car than its predecessor, although that car was a most attractive appearing vehicle. It is a somewhat altered body line to bring it into accord with present-day body fashions, the popular straight-line effect being well carried out. Being $4\frac{1}{2}$ inches longer, wider and in every way more roomy, and having a slanting windshield and new style crowned fenders, the new model takes its place among the distinctive cars of the season, reflecting much credit upon the designers who were able to impart so many added features without increasing the purchase price.

In addition to greater comfort due to softer and deeper cushions, the new six is fitted with new cantilever springs which are of the full cantilever type. In the previous model, the springs were of the half cantilever type at the rear and measured 30 inches in length. In contrast, the new rear springs are $41\frac{1}{2}$ inches long, and trunnioned to the frame in the middle and mounted under the axle tubes at the rear.

This form of springing is a very easy-riding arrangement and it does a great deal in increasing the easy riding qualities of the Saxon six. The front springs remain of the semi-cantilever variety, $27\frac{3}{4}$ inches long.

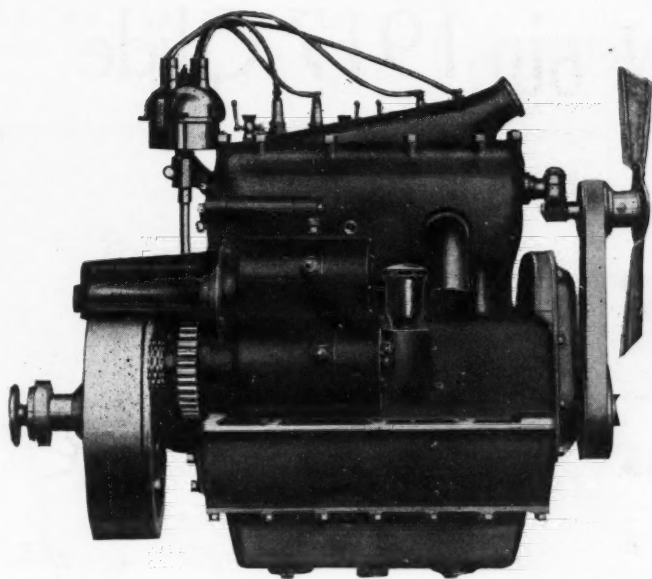
In the six-cylinder motor, several changes are to be found, perhaps the most important of which is the increasing of the size of the crankshaft to a diameter of 2 inches, which is really quite large for a motor of this size— $2\frac{7}{8}$ by $4\frac{1}{2}$, and developing from 30 to 35 horsepower. This new shaft has been well balanced, and with its added rigidity it makes for a very smooth-running power unit free from crankshaft vibratory nuisances. Another important motor change in the six is the shifting of the carburetor from the left or valve side to the right side where it attaches directly to the cylinder block, and the gas passages are cored with in the casting. Heretofore, the carburetor occupied a position on the left.

Wagner Starting and Lighting

As on the four, Wagner starting and lighting system has replaced the previously used make, the new system being a two-unit outfit, with the starting motor carried on the right rear, so as to gear temporarily to the flywheel teeth for starting; and with the generator placed on the left side and driven by silent chain connecting with the crankshaft.

There is a change in the ignition also, the Remy distributor replacing last season's make, though placed in approximately the same position on the right side of the motor and driven by gear connection with the camshaft. To make the valve springs still more serviceable, they are now made of chrome-vanadium steel, rendering them more nearly impervious to fatigue, and though a refinement that does not show, they are really a feature of utmost importance when the durability of the car is considered.

Two other new features that add to the appearance of the six are the grouping of all of the instruments in a plate on the



Four-cylinder engine of Saxon showing mounting and drive of electrical units

cowl dash, and the fitting of a new style of top having more of a curve at the rear. This top possesses what is called a Grecian rear bow, and it is surprising how much this one thing adds to the machine with the top up. The four-cylinder model is also fitted with this form of top.

Details of the Six

On the testing block, the engine delivers 34.7 horsepower at a speed of 2,200 r. p. m., which indicates that it lives up to the advertised rating of 30 to 35 horsepower. The dimensions of $2\frac{7}{8}$ by $4\frac{1}{2}$ inches give a good relation between the bore and stroke, and among the first impressions one gets when looking at this powerplant is the compactness of the whole thing. The cylinders, cast in a block, are integral with the upper part of the crankcase which carries the bearings, thus insuring correct alignment between the shafting and the cylinders and also making for rigidity. The cylinder head, carrying a large water outlet connection, spark plugs, petcocks and fan bracket, is removable for cleaning of the valve chambers, valves, cylinders and pistons. The lower half of the crankcase, carrying the oil reservoir, is a steel pressing that is light in weight.

Aside from the increase in the crankcase size, there is no internal change of note. The valves have a diameter of $1\frac{7}{8}$ inches, and have nickel-steel heads welded to carbon-steel stems, a feature of the valve assembly being the long guides in which the valve stems operate, this preventing undue wear and making a smoother operating valve. As heretofore, each piston is fitted with a Burd high-compression ring at the top, below which are two eccentric rings of conventional type.

In connection with the adoption of Remy battery ignition, it might be mentioned that an ignition wiring manifold has been fitted, this attaching to the exhaust pipe manifold, and running in such a way as to prevent the wires from dropping onto the hot pipe. The spark plugs are placed

over the intake valves so that they are not subjected to the great heat that they would have to undergo if they would get the hot gases sweeping past. This gives the plugs longer life.

Back of the motor there is a dry-disk clutch housed in the flywheel, and then the power is transmitted through a universal joint to the propeller shaft. This shaft is inclosed within a torsion tube having a yoked front end that hinges to a frame cross member. The gearbox, containing the usual three forward

and reverse gear changes, is mounted in unit with the rear axle, and between the rear end of the torsion tube and the front of the axle housing.

The rear axle is made by Timken, and has a pressed-steel housing that is very compact in design. The differential is of the two-pinion type, which is a factor for lightness, and it is carried on Timken roller bearings, as are also the rear wheels. Constructed of special steel stock $1\frac{1}{8}$ -inch in diameter, the axle drive shafts are amply strong for the work they have to do. The driving gears are helical-bevel form, in which a rolling action is imparted to the mating gear surfaces, reducing gear noise to the minimum and because of greater tooth contact, strengthening the driving connection between the ring gear and pinion.

Saxon uses a pressed steel channel section frame of good proportions in this car, it having a channel depth of $4\frac{3}{8}$ inches, with of flange $1\frac{1}{4}$ inches, and $\frac{3}{8}$ -inch stock. It is tapered to support the body in good manner, and has ample cross bracing so

that there should be no trouble due to frame distortion from any cause in normal usage.

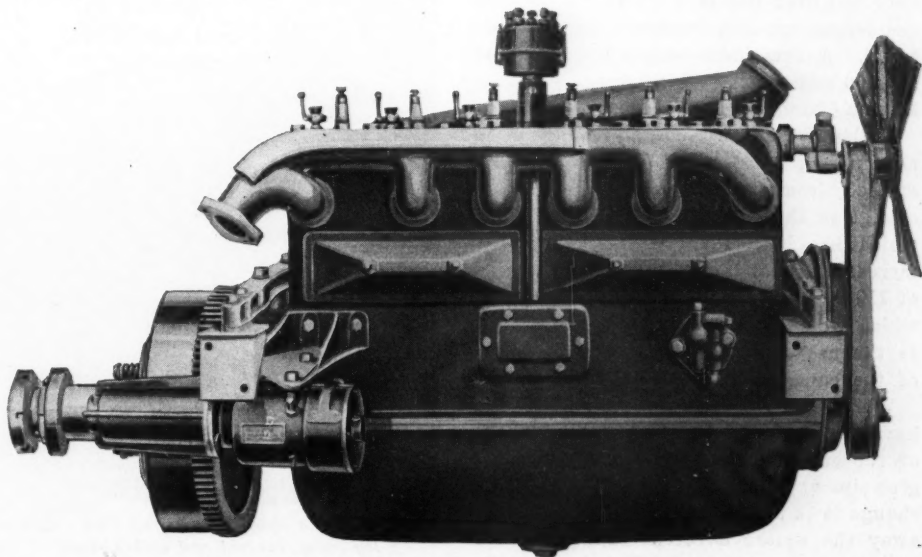
The Saxon Four

Like the six, the Saxon four also has a new body shape, and with its complete equipment, it is an attractive little car. The increasing of the diameter of the tires by 2 inches gives a higher standing car with more road clearance, an advantage to be appreciated. The front axle clears the road by $11\frac{1}{2}$ inches, while there is 9 inch clearance at the rear axle. Another factor in connection with the larger tire equipment is undoubtedly important, this being the great excess of tire strength as compared with car weight, a fact which should reduce the tire bugaboo almost to nil.

The new roadster appears with a change in the carbureter equipment also. The new Reichenbach atomizer type of instrument replaces the make used heretofore, finding about the same location, however, on the left side.

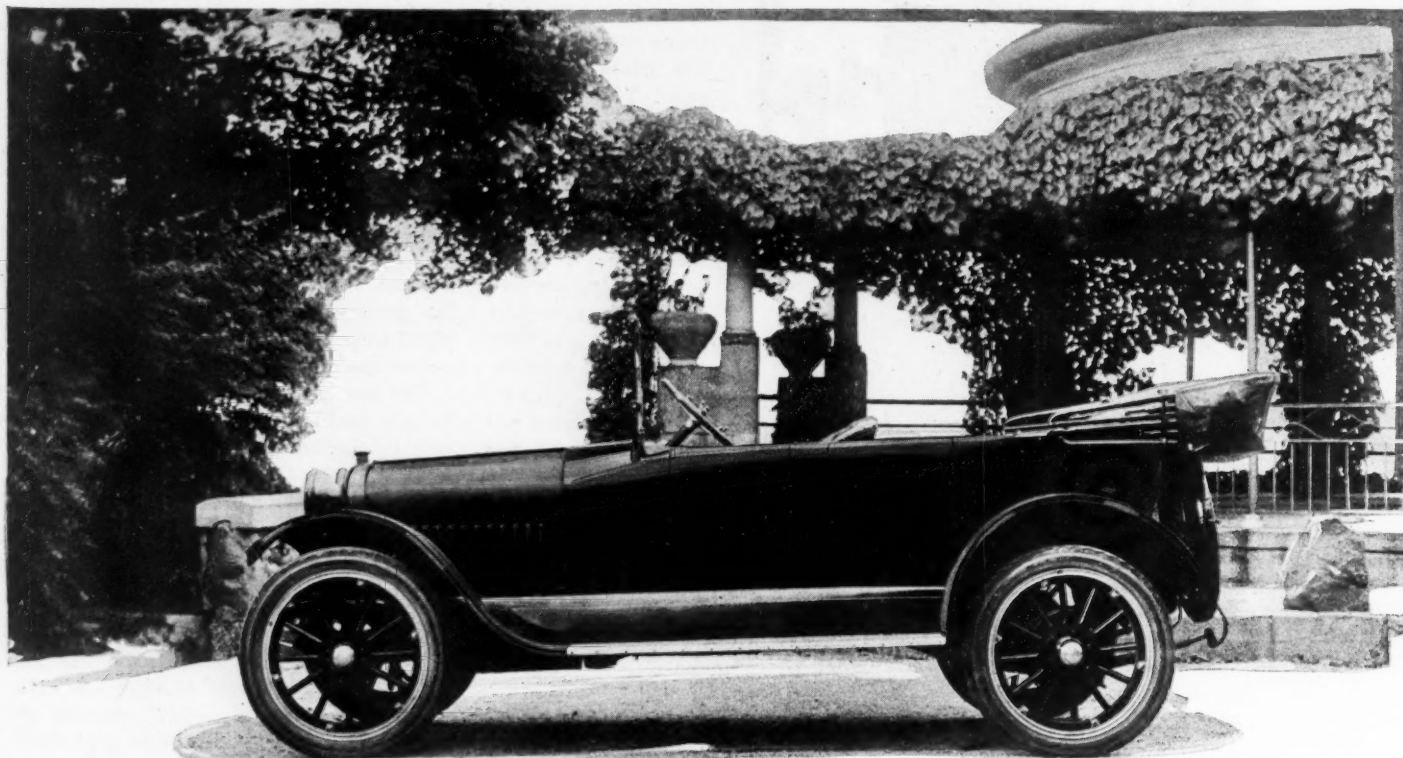
Much thought seems to have been given to the matter of comfort in this new four, for with the wider seat and better upholstery, it is on a par in riding qualities with its more complete fitments. The seat has a depth of 17 inches and is 40 inches wide, and a distance of 30 inches has been obtained between the headboard and dash. Doors also are wide, they measuring 8 inches across. With the coming of electric lights, fitted with means of dimming for city driving, the side oil lamps have disappeared from the windshield, a change that will be appreciated.

The Saxon four has a $2\frac{3}{4}$ by 4 motor that is very similar to the six in general design. The cylinders and crankcase are integral, with an oil reservoir forming the bottom of the powerplant, and the cylinder head detachable as a unit. The crankshaft has two large bearings, and is inserted through the end of the crankcase, which is of the barrel type. Internally, the engine is conventionally designed with all parts substantially built. Eighteen horsepower is claimed for the unit.



Saxon six motor with larger crankcase and minor refinements

More Room and Power in 1917 Glide



The five-passenger Glide six tourist model, which sells for \$1,125

Model 6-40 Continued with Slightly Larger Engine and More Body Space at \$1,125

A LARGER and more powerful engine is the chief change in Glide cars for 1917. The single chassis, model 6-40, is continued with refinements and no additions have been made by the Bartholomew Co., Peoria, Ill., the manufacturers. Alterations in the car are such as to render it more roomy and to increase the factor of safety. There also have been a few alterations which would tend towards making the car more nearly silent. The five-passenger tourist is \$1,125, an advance of only \$30 over the 1916 figure, in spite of the larger car and increased cost of material. A detachable sedan top is offered at \$200 additional.

Engine Change Most Notable

Probably the most notable change is in the engine, where the bore has been increased from 3 to 3½ inches. Another change in the engine is in the crankshaft, which has been rendered more rigid by increasing the diameter to 2 inches instead of 1¾ inch. Another change in the engine which would tend to make it noiseless is in the use of a Fabroil gear on the end of the camshaft.

While the mechanical changes noted have the most to do with the performance of the car it is also altered to some degree in appearance. The most notable change is in the rounded cowl, which takes away the square effect at the windshield and the latter is especially built to con-

form with the rounded shape of the cowl and fits exactly to its curvature.

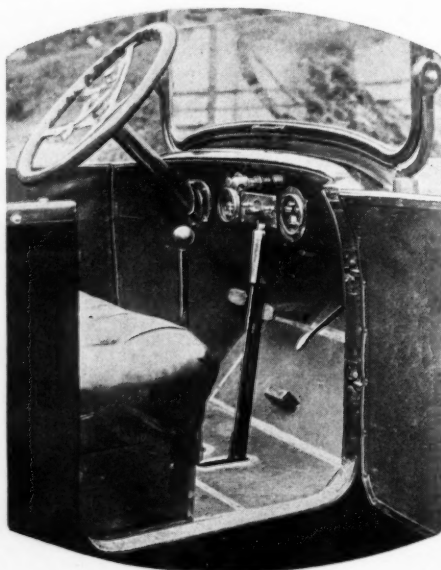
As far as comfort features are concerned the most notable change is in the width of the rear seat which is now 47 inches and will accommodate three adults very comfortably. The springs have been lengthened both front and rear, giving an easier suspension, the dimensions being now 36

and 54 inches, respectively. In general, all the parts and accessory equipment made by specialists have been retained, this includes Westinghouse lighting and starting, Rayfield carbureter, Brown-Lipe three-speed gearset, Spicer universals, etc.

While only one chassis model is marketed the body line is quite complete, as the car will be furnished in the regular touring models and with a detachable sedan top if desired. There is also a four-passenger close-coupled roadster in the process of production in which particular attention is stated by the makers to have been paid to the comfort of the occupants of the rear compartment. For instance, by a special arrangement of the footboard in the rear, the passengers have as much room for their feet as those in the front.

All the improvements in the body can readily be summed up in the words, increased roominess. The 47-inch rear seat is 5 inches wider than in the 1916 car. The front seat is 1½ inches wider than previously. The windshield is 1¼ inch wider and 1½ inch higher, besides the alteration in curving it to conform to the shape of the cowl. The top is also new, being a five-bow design with bare top holders and having the rear curtain fitted around the corners of the body to exclude dust. It is fastened to the back of the body by German silver moulding.

A unit power plant is employed having



This gives a conception of the wide door, leg room, control and instruments of the new 'Glide six

block cylinders and three-point suspension. The six cylinders have a bore of $3\frac{1}{8}$ and a stroke of 5 inches and are of L-head form with the valves on the right side. This is a Rutenber product designed particularly for the Bartholomew company, and is known as model 25.

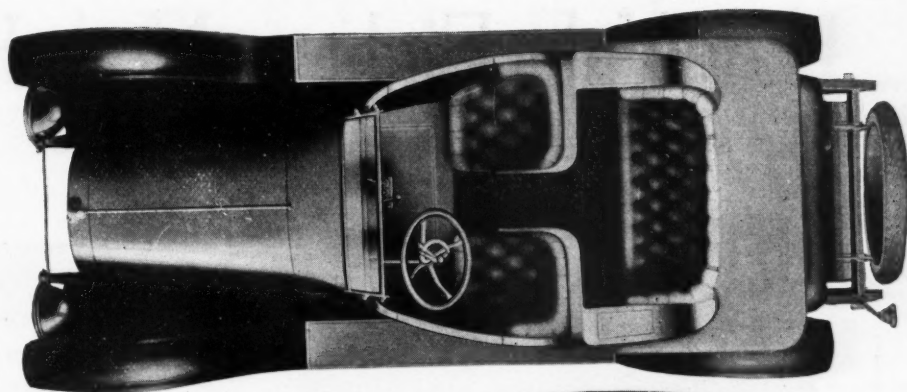
Valve Construction a Feature

One of the features of the valve construction is that the brackets, together with the entire lifter mechanism can be taken from the engine without disturbing the camshaft. This is done by removing the cover plate and stud nuts and then turning the starting crank until the valves are at their lowest level.

Lubrication is by a combination pressure and splash feed with a $1\frac{1}{2}$ -gallon reservoir in the bottom pan. From this the oil is drawn by a plunger pump which is driven by an eccentric off the camshaft. There are direct leads from the pump to the main bearings which thus receive a supply of oil under pressure. The other leads go direct to the crankcase where the oil is led to splash troughs placed beneath each connecting rod throw. Provision is made for the mounting of an oil pressure gauge and this may be regulated by an adjustable relief valve.

From the engine the power is taken by a dry multiple-disk clutch having twelve steel plates. Six of these are faced with Raybestos. The gearbox is a Brown-Lipe selective type mounted in an aluminum case, to cut down weight. From this the drive passes through a Spicer universal joint which is dustproof and self-lubricating. The propellor shaft is hollow, having a tubular section and taking the drive directly to the pinion shaft upon which is mounted the spiral-bevel pinion which transmits the forward propulsion to the floating axle shafts through the Brown-Lipe differential. Two sets of brakes with 14-inch drums having a face width of 2 inches are bolted to the rear wheels. The foot or service brake operates on a contracting band with the expanding band for the hand brake.

Hotchkiss drive is used as both the propulsion and torque strains are absorbed in the springs. This is in conformity with the policy to be noted throughout in keep-



Four-passenger roadster on Sun six

ing the car as light as possible. The tires are 34 by 4 and are fitted on rims which may allow the tire to be detached, if necessary, without removing the rim from the wheel. The steering gear is screw and nut type with 18-inch rim on the wheel. The wheelbase is 119 inches.

The price mentioned is for the five-passenger body. A detachable sedan top can be had for \$200 additional.

FOUR-PASSENGER SUN

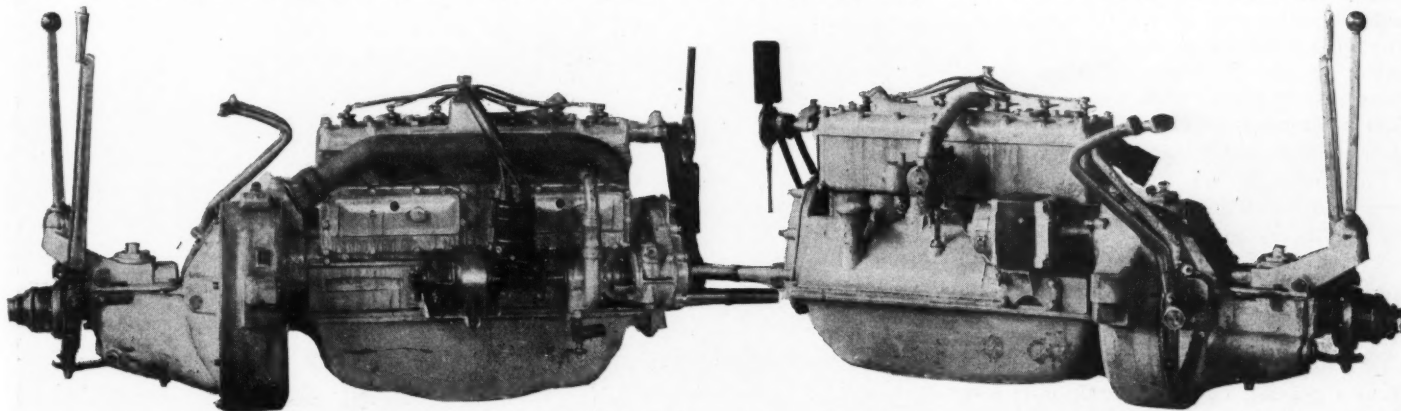
The 1917 clan of four-passenger roadsters has another member in the new Sun Light six. The new body has low, sweeping lines, a sloping windshield and a double cowl. The back deck is truly roadster in design and, as a whole, the car has racy, rakish lines. The price is \$1,095.

The front seats are divided with a generous passageway. The rear seat is built

to seat two comfortably and allow plenty of leg room. The backs of both seats are high enough so that the passenger's shoulder has a support. Turkish rocker springs are used in the upholstery.

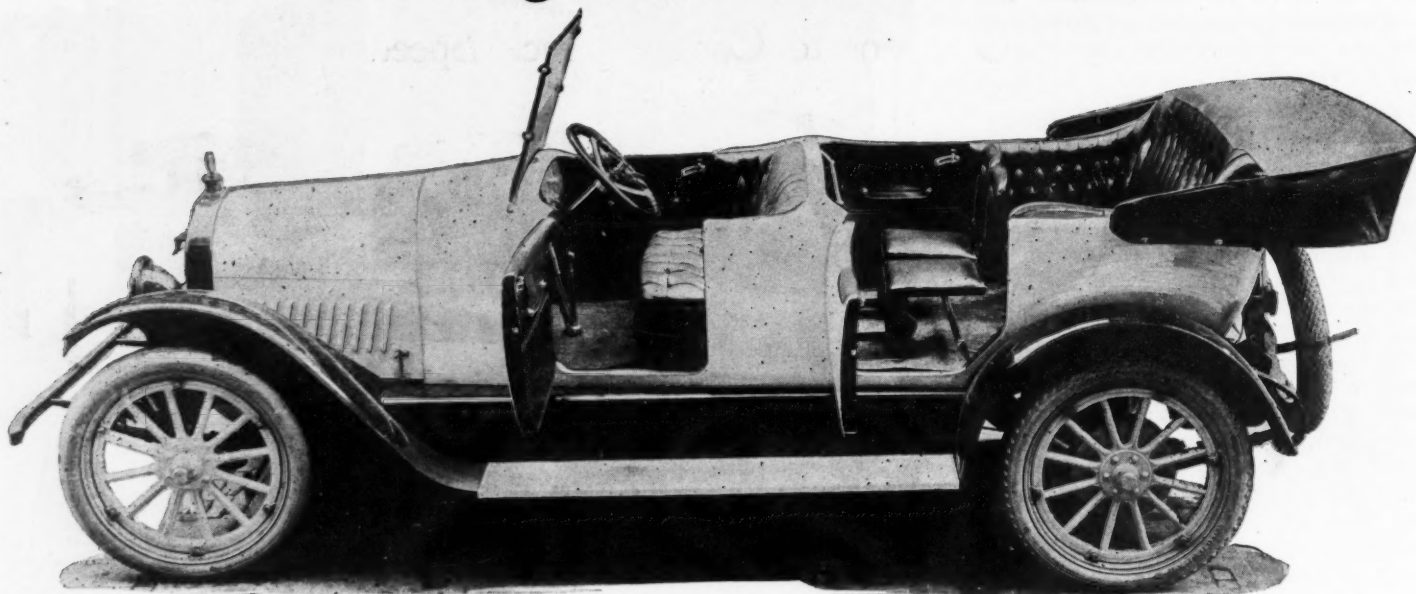
The compartment in the rear deck is sufficiently large to accommodate a couple of suit cases with room left for other touring necessities. The door is conveniently located at the extreme end of the deck, making an easily accessible carrying space.

There is a one-man top with Jiffy curtains. This top is provided with a visor that seals the front of the top with the top of the windshield, preventing rain from dripping in on the passengers. This four-passenger roadster is one of the five 1917 models built by the Sun Motor Car Co., Elkhart, Ind., including a five-passenger touring, a seven-passenger touring, a two-passenger roadster and a five-passenger sedan, all on the 116-inch wheelbase chassis.



Two views of the Glide six power plant. One shows generator and distributor mounting, while the other indicates the location of starting motor and carburetor

Yale Eight a New Product



How the seating is cared for in the Yale eight. Roominess is a feature

Saginaw Motor Co. Offers Car Incorporating Its Octuple-Cylinder Engine

THE Yale eight, a new production and made by the Saginaw Motor Car Co., Saginaw, Mich., for the present, will be supplied only in seven-passenger form at \$1,350, though the addition of a winter top is contemplated. The standard color is ivory white for the body with black fenders and trim. Yale blue and black is optional without extra cost.

The attempt to reduce wind resistance to the minimum is apparent in the body design. The hood is tapered to blend well with the rather deep cowl and the sides are perfectly smooth. The windshield is smartly raked. There is a cowl at the back of the driver's seat which serves to house the auxiliary seats. All doors are fitted with pockets. The upholstery is leather and the backs of the seats have been moulded to fit the back.

Great care has been taken to insure excellent riding qualities and to this end the weight has been proportioned over front and rear axles only after long experiment. The spring suspension is normal in front, but in the rear there is modification of the three-quarter elliptic idea, which, however, does not appear unusual to the eye. The springs are 56 inches long.

The motor is the Saginaw company's own product and is an eight-cylinder $3\frac{1}{2}$ by $4\frac{1}{2}$ inches and giving a rated horsepower of 31.25. The cylinders are L head with the valves on the inside and operated by a single camshaft. Stock parts are used aside from the engine itself, the carburetor being Rayfield. There is a three-speed Muncie gearset, Lavine steering gear and Timken axle.

The Remy-ignition unit is accessibly

mounted directly at the front of the V. The electric lighting and starting system is a unit outfit and the battery is a Willard. The tires are 34 by 4 non-skid in the

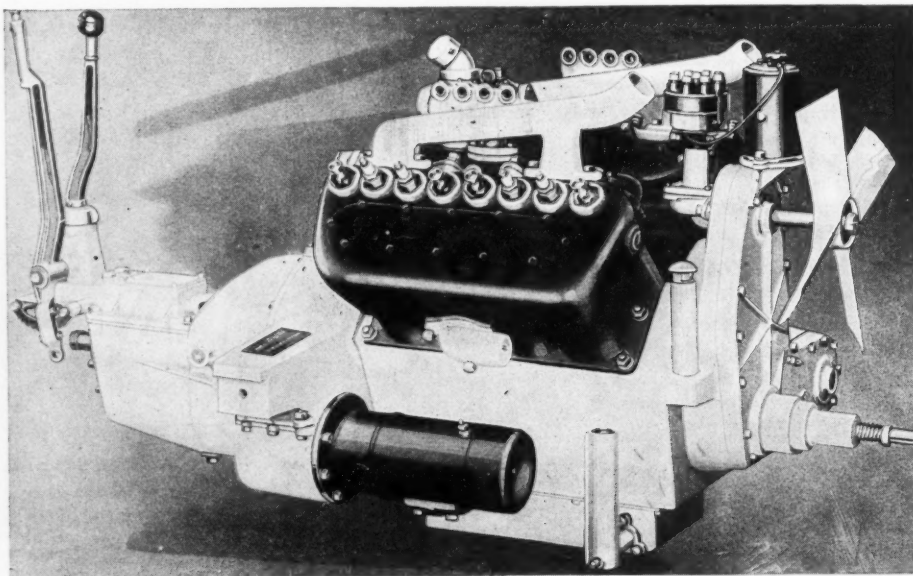
HEATERS ON OWEN AND HAYNES

Cleveland, O., Sept. 25—All Owen-Magnetic winter bodies for the coming season will be equipped with perfection heaters, the contract just having been given the Perfection-Spring Service Co., of this city. The heater manufacturers have also received an order from the Haynes Automobile Co., Kokomo, Ind., and all Springfield type bodies will have the heater.

rear and the car has a wheelbase of 126 inches.

Lubrication is primarily by force feed with auxiliary oiling by splash. Cooling water is circulated by thermo-syphon action. The clutch is a multiple-disk type transmitting power through a three-speed selective gearset in unit with the motor. The Hotchkiss type of drive is used.

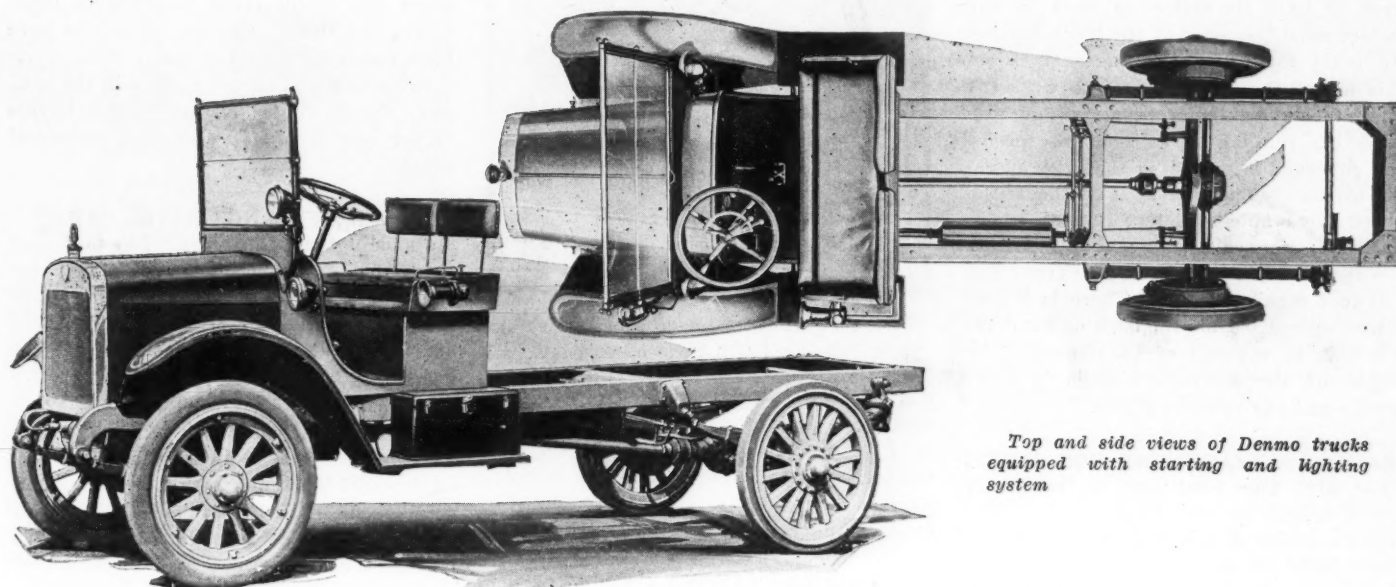
The Saginaw Motor Car Co., has recently purchased the plant of the American Electric Wheel Co., which will be used to facilitate production. The E. B. Sutton Sales Co. has taken over the entire distribution of the Saginaw company.



The power plant of the Yale eight, showing mounting of equipment

Denmo Truck Electrically Equipped

Governor to Control Truck Speed



Top and side views of Denmo trucks equipped with starting and lighting system

A STARTING and lighting system, an unusually suspended radiator, a governor controlling truck speed rather than motor speed, and a 9-foot loading platform with only a 16-inch overhang are among the features which savor of innovations in the new Denmo truck manufactured by the Deneen Motor Co., Cleveland.

The new Denmo model 10, the first truck to be placed on the market by this company, is a $1\frac{1}{4}$ tonner. While the design in conventional the construction has been simplified wherever possible.

A Splitdorf-Apple two-unit starting and lighting system is used in conjunction with battery which is suspended in what is called a spring cushion cradle, which is designed to take away the vibration from the battery—a fault which has proved bothersome in trucks.

Wisconsin Truck Motor

Going into the details of construction, it is found that a Wisconsin truck motor is used. It is a four-cylinder motor cast in block, $3\frac{3}{4}$ bore, 5-inch stroke.

Lubrication is force feed, no splash being provided for the rod ends. This insures distribution of oil to all of the bearing surfaces, regardless of the grade or angle at which the motor is worked. The system is so designed that the motor gets just enough lubrication on the piston sides, but the oil does not get up over the top of the piston to cause smoking, pitting of the valves or sooting up of the spark plugs, according to the makers.

The upper half of the crank case is made from a single aluminum alloy casting. It is well ribbed and supported. Crank shaft bearings are supported by heavy webs extending through the entire depth of the crank case. Gearset is of selective sliding

gear type, three speeds forward and one reverse and is carried as a unit with the motor. All bearings are of the annular ball type carefully mounted. Gears and shafts are made of nickel steel, machined, hardened and ground.

A Fedders cellular-type thermo-syphon radiator is used. The radiator has a large cooling surface of a fan mounted on adjustable ball bearings to assure sufficient current of air to keep the radiator cool.

The radiator is carried on a cushion spring suspension to eliminate severe shocks and vibrations. It is suspended on a steel angle bar, which in turn is suspended on springs at each end. The radiator has full bearing on the angle bar across its entire width. This permits the use of a simple, light efficient radiator.

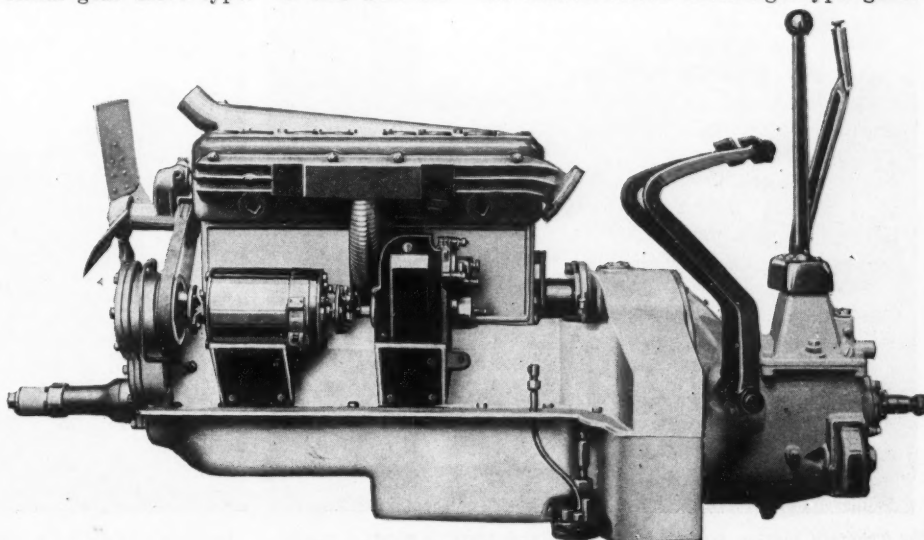
The rear axle is of the Torbensen internal gear drive type. In this axle the

load is carried on a solid forged I-beam section, while the power is transmitted to the wheels through a separate jack shaft member. All the drive parts are fully enclosed and ample lubrication is provided. The brakes are of the internal expanding and external contracting type. The service brake is equipped with an equalizer insuring the same braking action on both wheels. Brake drums are made of pressed steel 15 inches in diameter. Brake bands are 2 inches wide.

Stewart Carbureter

The carbureter is a Stewart. Provision is made for an abundant supply of heat to insure satisfaction and economical performance with the heavy fuel. A 20-gallon gravity feed gasoline tank is located under the driver's seat.

Denmo trucks are equipped with a gear-set driven Pierce centrifugal-type gover-



Wisconsin motor used in Denmo truck

nor. The governor is driven from the propeller shaft, so that it goes into action only after the truck has reached the speed for which the governor is set. The factory setting is 20 miles an hour. In other words, the Denmo governor is so arranged that it does not effect the performance of the truck or limit its ability to work in any respect until the speed of the truck reaches the point for which the governor is set. This leaves the operator free to work the truck to its maximum capacity and prevents his running it at reckless speeds. The governor is sealed so that the operator cannot tamper with it without the owner being able to detect it upon examination of the seals.

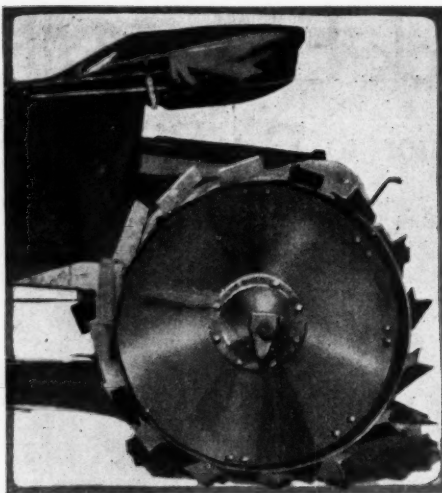
Wheelbase is 124 inches. The truck has a 21-foot turning radius. There is 9 feet of loading space from the back of the driver's seat to the end of the frame. The weight of the complete chassis is 3,050 pounds and the price is \$1,385.

TRACTOR ATTACHMENT FOR FORDS

For \$125 any Ford may be converted into a tractor in two hours' time. The device consists of a rectangular sub-frame which bolts on to the rear of the Ford frame, and which carries two heavy steel wheels which are driven by roller tooth gears on the axle ends, which mesh with internal gears on the wheels.

The ratio is 9 to 1, which gives a total reduction of 32.6 to 1. The machine is designed to operate on high gear exclusively, and since the reduction is 9 to 1, the speed of the motor at 2 miles an hour is equivalent to that of a Ford car running 18 miles an hour. The drawbar pull is normally about 1,200 pounds, and if low gear is used, but only in an emergency, the pull may be anywhere up to 2,000 pounds. The cooling efficiency is increased by adding a pump.

In attaching the Tracford, it is necessary to drill only two holes; one in each side member of the frame. The machine is designed for all sorts of farm work, including drawing spring tooth harrows, roll-



Tracford attachment applied to the Ford rear axle

ers, mowing machines, binders, corn harvesters, potato diggers, and plows. In fact, it is designed to do all the work that any tractor will do. The Standard Detroit Tractor Co., 1506 Fort St., West, Detroit, is the builder.

CHALMERS CLOSED CAR WEEK

Detroit, Mich., Sept. 25—The week beginning Monday, October 2, will be closed car week among Chalmers dealers. Closed cars will be displayed in show rooms all over the country, and in most cases special decoration will be employed. Many dealers are planning to give small souvenirs to prospects calling during this week. A number of dealers also are sending out engraved, or attractively printed, invitations, calling attention to the closed car week.

FRAUDULENT TIRE DEALING CHARGED

Akron, O., Sept. 25—On a charge of using mails to defraud, Carl F. Geyer, manager of the Double Service Tire and Rubber Co., here, and manager of two other tire concerns, and Ralph C. Harper, assistant manager, have been placed under arrest here by Federal authorities.

Geyer and Harper are charged with doing a fraudulent mail order business and federal authorities said they had sold hundreds of defective tires, representing them as standard quality.

The arrests are the result of a year or more of investigation here by federal officers and motor clubs of northern Ohio. Geyer and Harper also are alleged to have been receiving tires for repair without returning them. They sold stock in the company for 25 cents and guaranteed buyers 80 per cent dividends, according to federal officers.

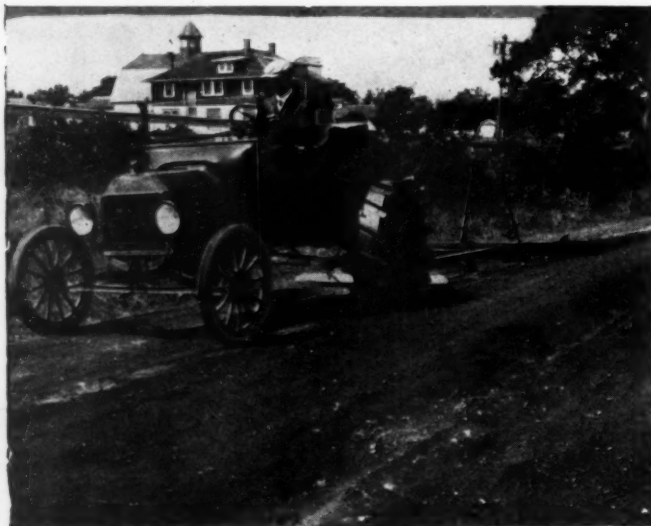
THEFT INSURANCE RATES RAISED

Bloomington, Ill., Sept. 23—Increased rates for insurance against motor car theft, have been decided upon by the Western Automobile Underwriters. Theft of cars has reached such proportions that the companies writing insurance face heavy loss. They will ask for more stringent penalties for those guilty of such thefts. The increase decided upon varies. The rate on lower-priced cars, which are in greater danger of theft, due to difficulty in identification, has been raised from \$2.75 to \$5. On cars valued at \$700 to \$1,200 the rate has been increased from \$2.25 to \$3.50. The rate on cars valued at \$1,200 to \$2,100, has been raised from \$2 to \$3, while on the higher-priced cars, the advance has been from \$1.75 to \$2.

FORMER DEALER UNDER BAN

Columbus, O., Sept. 23—Petition has been filed in the United States court by the Saxon Motor Car Corp., asking that Charles N. Bowen, former official distributor of Saxon cars for Columbus and surrounding territory be restrained from representing himself as the Saxon representative.

The petition states that last January the motor car corporation cancelled the contract with Bowen because he had failed to specify and receive deliveries of cars and did not promote the best interests of the company.



The Tracford pulling a road drag. Maximum speed is about 4 m.p.h.



The Tracford attached to a spring-tooth harrow. Both gears may be used

Ellsworth Truck at \$695 Electrically Equipped

Bodies Give Plenty of Leg Room for Driver

A \$695 COMMERCIAL delivery truck of 800 to 1,000 pounds capacity, completely equipped with an express body or a panel body and an electrical starting and lighting system, is the new product of the Mills-Ellsworth Co., Keokuk, Ia. The car is known as the Ellsworth model 25-A and it is of standard design throughout, built to be sold complete, although any type of body adapted to the chassis will be constructed on special order.

The unit power plant is located conventionally and supported directly from the frame. It comprises a block-cast motor, a cone clutch and a three-speed selection gearset. The motor has its valves on the left side. It is of the two-bearing type and is cooled by thermo-syphon circulation through a square-tube, sheet-metal encased radiator. Ignition is supplied from a storage battery through the Connecticut system, the spark advance being hand controlled.

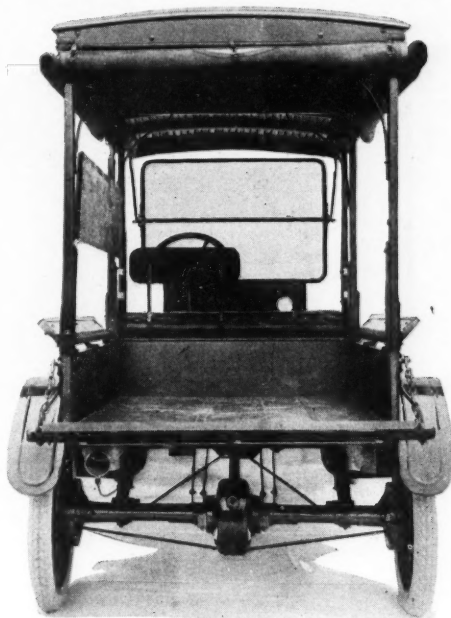
Torque and propulsion are taken through a long torsion tube, the rear springs being of the cantilever type. Left steer and center levers are used.

A few of the assembly parts which go to make up the chassis are: Lycoming motor, Carter carbureter, Apple starter, Connecticut ignition, Grant-Lees gearset, Gemco axles, full-floating rear; Parish & Bingham frame, Sheldon springs, and Foster steering gear.

Price of Express Body

The price named is for the express body, which is mounted on a 108-inch wheel-base chassis and includes demountable rim equipment with a spare. For \$25 additional, the panel-type of body will be fitted. This latter is constructed of steel.

In going over the outward appearance of the car it might be said that the designers have not overlooked the fact that a truck may be made of pleasing appearance. The hood and radiator are gracefully rounded and fenders front and rear coupled by run-



Rear view of Ellsworth delivery car showing carrying compartment

ning boards of ample size go as regular equipment.

A noticeable feature which is not always evident in truck construction is the ample leg room provided for the driver. The seat is suitably upholstered and fitted with a removable back behind the steering wheel side. Pneumatic tires, 30 by 3½ front and rear, are regular equipment.

The company expects to market between 500 and 600 trucks for its first year.

REO COMPANIES CONSOLIDATE

Lansing, Mich., Sept. 23—The Reo Motor Truck Co. and the Reo Motor Car Co. are to be formally consolidated by an exchange of the shares of the truck company for an equal number of shares of the car company.

According to an announcement sent out recently to the stockholders of the two companies, the directors of the Reo Motor Car

Co., who are also directors of the truck company, after careful consideration, believe the interests of both corporations will be best served by such a move. The same executive, selling and office organizations have endeavored to handle the business of both, and up to this time the same motors and many parts manufactured by the Reo car company have been used by both companies.

Increased business, it is pointed out, has correspondingly increased the difficulties in handling the affairs of the two corporations separately, and makes it impossible to secure the results that the directors are convinced can be obtained through one well-organized corporation.

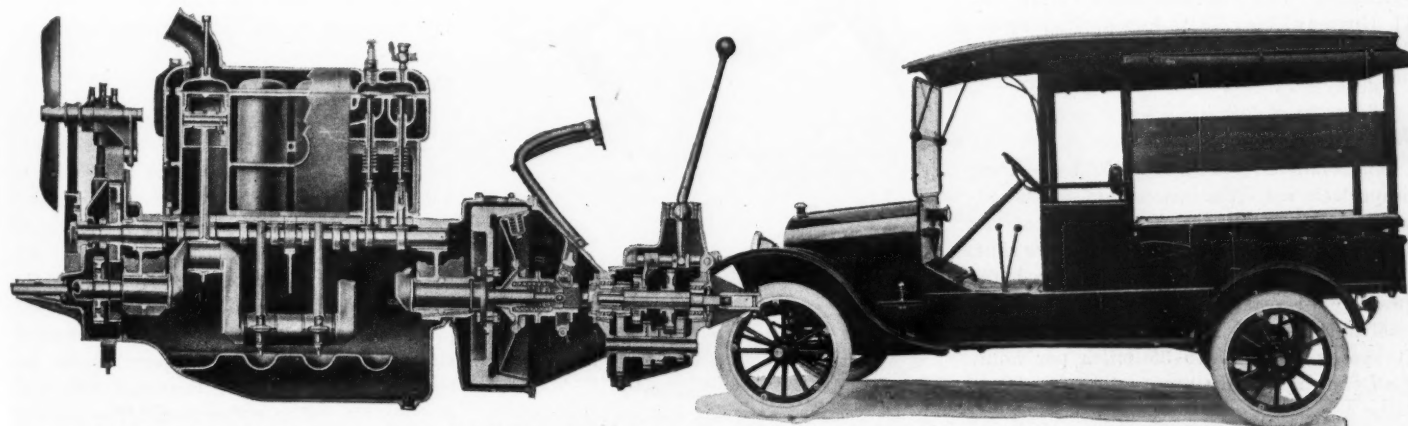
Accordingly, the Reo Motor Car Co. will purchase all Reo truck stock delivered to the Capital National Bank, Lansing, or to Secretary D. E. Bates of the Reo Motor Car Co., on or before September 20 and pay for these shares with car stock. The car stock has been selling on the Detroit stock exchange around \$44 per share, and the truck stock some five points under it, but today the truck stock climbed to the same figure as the car.

SEVEN-PASSENGER AT \$1,350

Saginaw, Mich., Sept. 23—The Saginaw Motor Car Co., which recently purchased the plant of the American Electric Wheel Co. in order to increase its output, announces the Yale eight to be supplied only as a seven-passenger car, at \$1,350. The E. B. Sutton Sales Co. has taken over the distribution of the Saginaw company cars and has established headquarters at the factory.

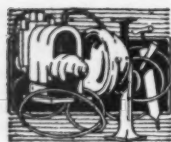
BUICK DROPS TRUCK

Flint, Mich., Sept. 23—The Buick Motor Co. has discontinued the manufacture of its 1,500-pound delivery vehicle. The truck followed standard design except that the motor and gearbox were carried on a quickly-dismountable sub-frame.

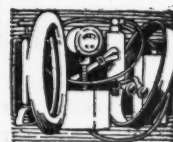


Cutaway view of unit power plant used in Ellsworth truck

Plenty of leg room for the driver in the Ellsworth delivery car



The Accessory Corner



Semi-Cast-Iron Pistons

THE Butler Mfg. Co., 1124 East Georgia street, Indianapolis, Ind., which specializes in regrounding cylinders and fitting new pistons is now in a position to furnish with its jobs either standard cast-iron, light weight semi-cast-iron or aluminum-alloy pistons. The company is featuring the semi-cast-iron piston with the claims that it combines light weight and high efficiency. The design of the piston allows for close clearance. A narrow rib is used to support the head and slightly heavier bosses. The pistons are designed in such a manner that the tendency is for the metal to draw in over the piston pin, not to expand and thus score the cylinder wall. All pistons are drilled in the groove below the bottom ring to allow for the escaping of oil. A complete record of every piston made and the size of every cylinder reground is kept by this concern. This insures the car owner of being able to secure a piston should one become broken through accident.



Butler Mfg. Co.'s semi-cast iron piston, showing oil drain holes

Substitute for Chamois

Chamoline is a recently introduced article which is claimed to have all of the properties of chamois with a quarter the cost. A full-sized chamois selling for \$1 will weigh about 2½ ounces and a chamoline, which weighs more, costs but 25 cents. It can be used wet or dry. The new cleaners are marketed by Peter Van Schaack & Sons, 114 W. Lake St., Chicago, which company is also an importer of sponges and chamois skins.

Alloy Pistons for Fords

The featherweight is an aluminum alloy piston for Ford motors. Being light in weight, each piston weighing about 1 pound, the installation tends to reduce the vibration and decrease the wear. Four sizes are supplied, the standard, .0025 oversize, .031 and .033 oversize for rebored cylinders. The Featherweight Piston Co., 11 Guyman Way, Pittsburgh, Pa., manufacture the pistons and list them for \$15 per set, including pins and rings.

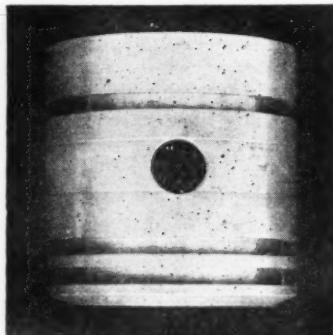
Spark-Controlled Air Valve

Air admitted to the manifold in direct proportion with the amount of spark advance is the principle of operation of the Taylor air valve. The makers believe that, if a carburetor is properly adjusted for quick get-away, for hills and sand, it wastes gas when running on level roads at speeds from 15 to 35 miles per hour. Also that it is only proper to run with a fully advanced spark when you are sailing along with no hills or sand. There-

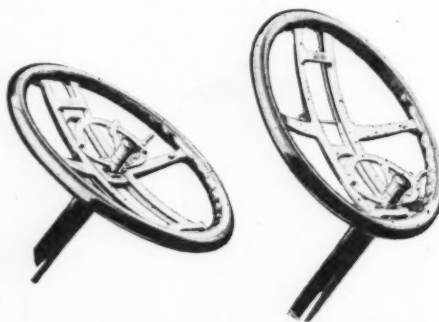
fore, they believe that the carburetor should be assisted when the spark is fully advanced. The valve is screwed into the manifold with the valve stem pointing toward the spark mechanism under the hood. A steel wire connects this stem with the spark mechanism so that the valve is opened only when the spark lever is fully advanced. Taylor Mfg. Co., 969 Jefferson Ave., Detroit, is marketing the device for \$5.

More-Room Steering Wheel

Press a button and thus release a lock, and push your steering wheel forward 8 inches—8 inches more room for getting in and out of the driving seat. This is the method of operation and purpose of the Neville more-room steering wheel. There are two regular styles, one with a polished-aluminum center wheel with mahogany rim and one with a plain malleable-iron wheel furnished in black. The former is slightly more expensive. A special more-room wheel for Ford cars has a thief-proof lock attachment which locks the wheel when the car is not in use. The manufacturers also offer a wheel for Fords with thief-proof, lock, but without the more-room feature.



Featherweight piston for Fords which weighs 1 pound and is made in four sizes



More-room steering wheel which gives driver 8 inches more freedom



Air valve which may be used with Stewart vacuum system

Assistant Carburetor

To attach the aer-in assistant carburetor a hole is tapped in the intake manifold at the most central point relative to the intake valves, as close to the butterfly valve as possible. If the car is equipped with the Stewart vacuum system, it is not necessary to tap the manifold, as the manufacturers have a special brass tee, which can be inserted in the manifold where the vacuum is taken. The vacuum pipe and aer-in are attached to this tee. The introduction of air into the manifold is through an automatic valve which regulates the amount admitted in accordance with the speed of the motor and consequently the requirements. Ware Bros., 224 N. Ada St., Chicago, are the marketers of the device, and the cost is \$5.

Nut and Bolt in Unison

The spring nut lock is designed to make it impossible for a nut to drop off the bolt on which it is placed. It is also said to hold the nut securely at the point placed. It consists of octagonal plates of thin steel stamped out of one piece, leaving a joint on one of its eight sides. Holes to fit the required size of bolt are punched in each plate, and the plate is then bent over until the two holes are almost parallel, an allowance being made so that one hole will overlap the other a fraction. The joining side acts as a hinge and, after, being tam-

pered, acts as a strong spring. When the lock is slipped in the bolt and both legs engage the thread of the screw, the holes in each of the legs are brought into alignment. Because of this forced alignment of the holes, the spring exerts a powerful pulling force on one of the legs and an equally powerful force on the other leg. The Industrial Development Co., Transportation Bldg., Chicago, is marketing the new device.

Hi-Lo-Jack

The toggle joint principle is incorporated in this motor car jack, enabling the operator to lift a heavy weight with a minimum of exertion. As shown in the illustration the upper and lower joints of the toggle are fastened to the top and base of the jack, respectively. The horizontal screw connects the two other joints and applies the leverage that raises or lowers the jack. A ball thrust takes the side pressure, eliminates friction and aids easy lifting. In the closed position the jack is 5 inches high and will lift the load to 17 inches. Owing to the construction the lifting power increases with the height, and a graduated scale is attached showing tons in inches which can be lifted with safety. Hi-Lo-Jack Co., 140 Green St., Worcester, Mass.

Anti-Skid Shoe

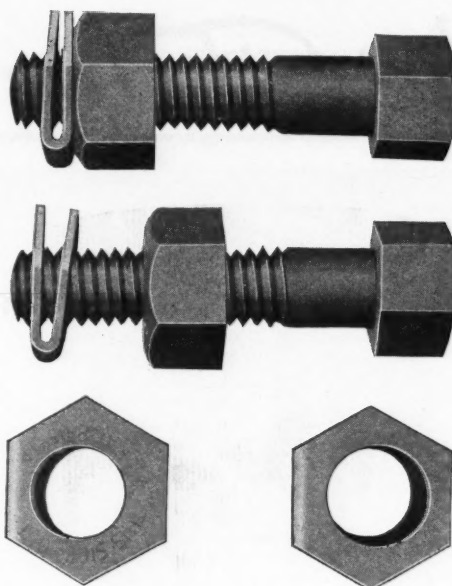
Extra traction and tire reinforcement is provided by means of a heavy leather, metal-studded section strapped on the outside of the casing. It is made of two-ply leather, reinforced on the tread by an extra strip and studded with rivets having heads about $\frac{1}{8}$ inch thick. Each section is about 8 inches long and provided with several cross chains that may be readily removed or replaced as the road conditions require. The maker is the Auto Anti-Skid Shoe Mfg. Co., 31 Nassau St., New York. The prices are: 3 to $3\frac{1}{2}$ inches, \$2.50; 4 to $4\frac{1}{2}$ inches, \$2.75, and 5 to $5\frac{1}{2}$ inches, \$3.

Rub-R-Tite Patch

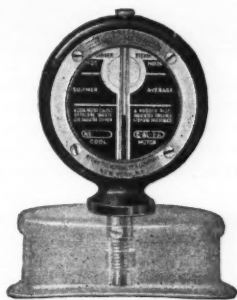
A water-tight patching for tops, side curtains and cushions is made by the Auto Products Co., 40 Elm St., Buffalo. After cutting to the desired size, the linen coating is removed from the adhesive side and the patch applied. It is said that the patch is scarcely noticeable. One sheet, 4 by 12 inches, costs 50 cents.

Venus Dry Storage Battery

The Venus is a storage battery having no liquid electrolyte. The case is made from steel, lined with acid-proof material and made very rigid. The plates are made in the form of an endless loop and packed in the special electrolyte that requires no additional moisture. A mineral condenser at the top of the cell automatically returns all of the moisture to the battery. The charging requires a direct current of 4 amperes for 5 hours followed by 2 amperes



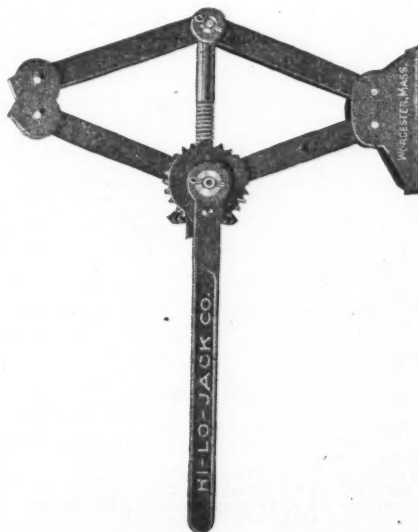
Spring nut lock which holds nut from outside



New Boyce Moto-Meter designed especially for Overlands



Hi-lo-jack folded up to be placed in toolbox



Hi-Lo-jack opened for use. The toggle joint principle is used

for 5 hours. For lighting system 6 cells are needed, giving 6 or 12 volts and 50 amperes. Self starters need 12 cells giving 6 or 12 volts and 100 amperes. It is said that the cells are light, strong and efficient; they can be recharged many times. Venus Dry Storage Battery Co., 64 Second St., Detroit. The price for a 2-volt cell is \$2.50.

Warner Lock for Ford

The crank of the Ford is locked in mesh with the crankshaft and the motor may not be turned over until the lock is released. A hinged metal member is bolted over the front spring clip and carries a heavy padlock that permits the crank to be held in mesh with the crankshaft. G. H. Warner Co., 318 Century Bldg., Indianapolis, makes the device which has a retail price of \$1.50.

New Boyce Moto-Meter

At the suggestion of the Willys-Overland Co., the Moto-Meter Co., Inc., New York City, has designed and is now ready to offer to the owners of Overland cars, a new type of Moto-Meter, which differs from the other type only in the design of the stem. This stem takes the place of the screw used on Overland radiators. To attach it is only necessary to remove the present screw which secures the radiator cap to the radiator and enlarge the hole to $\frac{1}{2}$ inch. Formerly, to install a Moto-Meter on an Overland car it was necessary to install a special fitting.

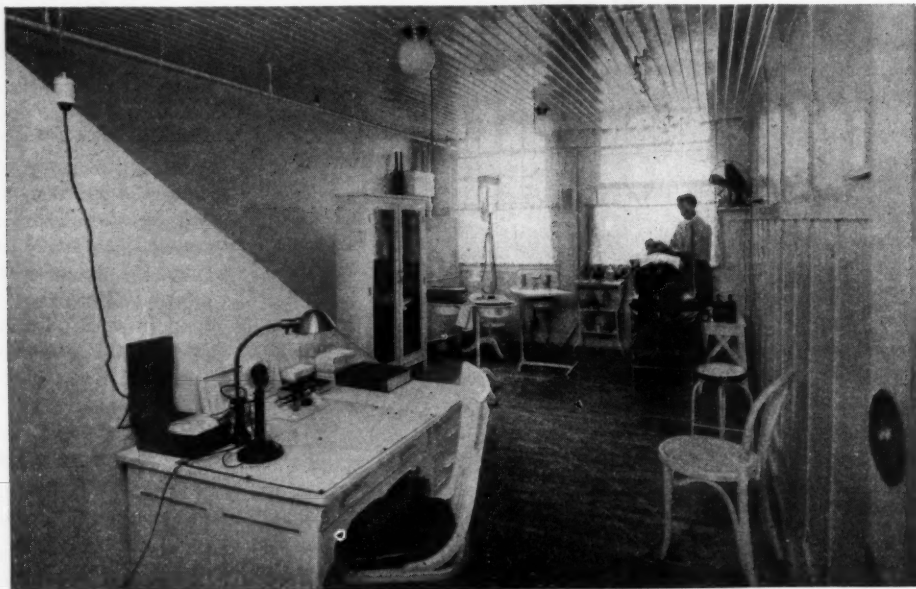
Demountable Wheel for Fords

A device providing a quick wheel change for the Ford is made in Grand Rapids, Mich., by the Simplicity Demountable Wheel Co. Special hubs are placed on the axles; these hubs having projecting bolts to which the Ford wheels are readily bolted or removed. The installation requires that the wheels be removed, the special hubs substituted and an inner flange bolted to the inside of the wheels to take the place of the hubs removed. An extra wheel, a side-carrying bracket and all tools for the change are included. It is said that the change may be made in 4 minutes. Price complete, \$15.

Weaver Towing Pole

An adjustable length pole that may be fastened to the front or rear axle of any car, enabling it to be towed with safety. The pole proper is made from steel tubing, which is adjustable from 5 feet, 6 inches to 8 feet by means of a key pin. At each end are metal sockets carrying a 30-inch leather strap that permits attachment either to the axle, spring or frame. The towed car may be pushed backwards, cannot jam into the forward car on hills and all shocks are absorbed by the double-acting spring mounted in the pole. Weaver Mfg. Co., Springfield, Ill., makes the pole and the price is \$10.

From the Four Winds



NATIONAL'S HOSPITAL—In connection with the Safety First movement recently inaugurated at the factory of the National Motor Vehicle Co., it has built and equipped a small but complete hospital, which is located on the second floor of the most central building. The hospital is in charge of a trained attendant, who is ready at all times to render intelligent relief and first aid services.

PENNSYLVANIA Cities Restrict Lights—

Harrisburg's new ordinance prohibiting the use of glaring headlights on motor cars went into effect last week. The city council of York, Pa., passed a similar ordinance recently and is now in effect.

Philadelphia Car Thefts Heavy—This year will break the record for the number of cars stolen from the streets of Philadelphia, Pa. So far 1,850 cars, valued at more than \$600,000, have been taken. The police have been unsuccessful in curbing the thefts.

Motor Car Exhaust Routs Bees—Another score for the motor car exhaust. It saved a school. F. O. Panter is a school director of the Heidelberg district, Smith Center, Kan. He has a car. Bees had made their home in the school building during the summer and chased the boys and girls away when they sought, so eagerly, to enter the building to resume their studies this fall. Mr. Panter filled the exhaust pipe with a hose, inserted the muzzle in the wall where the bees were living and routed them. The honey was not worth eating, but the children got to school.

Philadelphia Wants to Be a Detroit—The Philadelphia Chamber of Commerce is conducting a survey of the territory within 250 miles of that city to determine how Philadelphia stands in the country's motor car industry, and for the purpose of devising ways and means of making it an eastern Detroit. The manufacturers of cars, trucks, accessories and parts will be classified and comparisons made with similar industries in other centers with respect to labor, transportation, raw material, taxes, market and cost of fuel and power.

Woman Heads Motor Business—Mrs. E. C. Henry, wife of one of Omaha's prominent physicians and herself head of the Lord Lister hospital, occupies the unique position of being the only woman in this metropolitan city to head her own motor car business. Within the last week Mrs. Henry purchased the entire stock of the Johnson-Danforth

Co., a large vehicle concern and specializing in the manufacture of the Smith Form-a-Truck. The new owner, recognized as one of the city's most successful business women, will thoroughly reorganize the business. A night and day truck service also will be among the new features adopted.

Dynamometer and Monograph for University—An electric dynamometer and a gas engine manograph have been installed in the steam and gas laboratory of the college of engineering, University of Wisconsin, Madison, Wis., for experimentation with various gasoline engines manufactured in Wis-

consin. The dynamometer has a capacity of 150 horsepower at from 2,200 to 3,500 r. p. m. and is the second largest in the United States.

Jitney Buses Faded in Milwaukee—Only 306 jitney bus operators in Milwaukee, Wis., have taken out licenses so far this year, compared with 1,314 who were certified in 1915.

Crowded Hotels Postpones Meeting—Because of the crowded condition of the hotels in Columbus, O., the second annual meeting of the Ohio Automobile Trade Association, which was to have been held at the Virginia hotel, October 18 and 19, has been postponed until October 25 and 26.

Denver Overland Host to Orphans—The Willys-Overland Co.'s Denver, Colo., branch celebrated Overland day last week by giving 520 children from the city's orphanages an afternoon ride through the parks and boulevard system, with a treat of candy and popcorn for every child. The youngsters were carried in ninety-two Overland cars furnished by the distributing branch and about seventy-five individual owners.

North Texas After Speeders—North Texas has started a campaign against speeding, in an effort to cut down the numerous accidents that have resulted recently on county highways. The campaign is also on in Dallas county pikes. Sheriff Reynolds has employed two motorcycle deputies, who are chasing speeders. They made fifty-four arrests last week. The fine for speeding, with the costs, averages about \$25. The speed limit is 18 miles per hour. It may be raised by the next legislature, as a movement is on foot now for a new law.

County Commissioners Must Remit Fines—County highway commissioners in Wisconsin have no police power, nor have they authority to appoint policemen to patrol newly improved or any other highways, according to the opinion of the attorney general. Scores of motorists arrested in Brown county in recent months on charges of exceeding the speed limit will receive a refund of fines

Coming Motor Events

September 29—Track meet, Trenton, N. J.
September 30—New York, Sheepshead Bay
speedway race.
September 30—Raisin classic, Fresno, Cal.
October 7—Philadelphia speedway race.
October 7—Omaha speedway race.
October 14—Chicago speedway race.
October 19—Indianapolis speedway race.
October 21—Track meet, Kalamazoo, Mich.
*November 16—Vanderbilt cup race, Santa Monica, Cal.
November 18—Grand prize race, Santa Monica, Cal.
November 30—Speedway, Los Angeles, Cal.
December 25—Speedway, Los Angeles, Cal.

*Sanctioned by A. A. A.

SHOWS

October 14-31—Dallas, Tex.
October 15-November 1—Omaha, Neb.,
closed car salon.
January 6-13—New York show.
January 13-20—Montreal.
January 27-February 3—Chicago show.
February 18-25—St. Louis, Mo., show.
February 26-March 3—Omaha, Neb., show.
March 3-10—Boston.
March 6-10—Fort Dodge, Ia., show.

under the opinion. It appears that Brown county constructed a fine concrete pavement. The county highway commissioner then appointed a motorcycle cop, who used his authority to the utmost. One motorist looked up the law and resisted arrest, and his contention now is upheld by the attorney general.

Briscoe Predicts 5,000,000 Cars—By July 1, 1919, there will be 5,000,000 motor cars in use in the United States, predicts Benjamin Briscoe, president of the Briscoe Motor Corp., Jackson, Mich. At the present time he estimates that there are 2,400,000 in use in the country. These figures are from the little booklet which Mr. Briscoe has just issued and which bears the title "Looking Forward in the Automobile Industry."

Arizona Cars Increase—Arizona motor vehicle owners will pay into the state treasury this year over \$75,000. Up to September 1 the fees have amounted to \$69,353. More than 11,300 cars had been registered on September 20, or over 4,000 increase over 1915. Estimating the total number of automobiles owned in the state in 1916 at 12,000, and the population of Arizona at 240,000, Arizona will have one car to every twenty people this year.

Good Roads Activities

Burlington Way Meeting Sept. 29—A meeting will be held at Pontiac, Ill., on September 29 to organize the Chicago-Bloomington extension of the Burlington Way. Delegates from all intermediate cities are expected to be present. A permanent route will be decided upon and the marking of the trail provided for.

See Pennsylvania First Tour—The first of the three tours in the See Pennsylvania First trip of Governor Martin G. Brumbaugh and party was held last Tuesday, Wednesday and Thursday and traversed the north central and northern counties. The party, traveling in twenty-five cars and including about seventy-five persons, left Harrisburg early last Tuesday.

Illinois Has Forty-four Motor Roads—There are now forty-four motor car trails traversing the state of Illinois, probably more than in any other state of the union. Although Illinois has been slow in perfecting a system of hard roads, the motor clubs of the state have been seeking to overcome this defect, by improving the highways as much as possible and simulating interest in hard roads.

Knights Knock Toll Roads—The Knights of the Motor World, a recently organized body of Philadelphia motor car men, has pledged itself to the elimination of toll roads in this and other states. The Knights got together to promote the welfare of persons engaged in the motor car industry, and as a fraternal and social proposition, and is increasing in size daily. As a first step in the new direction petitions have been sent to all local garages with a request to have them signed by their patronizing motorists, who are disgusted with the ancient system of tolls prevailing in Pennsylvania.

South Carolina's Road Map—South Carolina is one of the states which has marked the poles and signboards along the main roads by colored bands, indicating the various routes of which the roads form parts. There are nine of these through routes in all, crossing the state in every direction. In order to make it as easy as possible for the traveler to follow any of them, the State Commissioner of Agriculture, Commerce and Industries has issued a map of South Carolina, in which the routes are indicated by the same colors used in the wayside marking. This is carrying the idea of making

roads of maximum convenience rather farther than has been attempted elsewhere, and is particularly interesting because South Carolina has no state highway department.

Ask Toll Road Abolishment—Five thousand signatures have been attached to the several petitions circulated by the York Chamber of Commerce, York, Pa., to be presented to the court asking to abolish the toll roads of York county.

Clubs and Associations

Club Backs Traffic Ordinance—The city council, Massillon, O., is wrestling with a new traffic code, which is being backed by the Massillon Automobile Club. One of the features of the code is the prohibition of jay walking.

Pennsylvania Club Elects—A charter recently was issued to the Red Lion and Dallastown Motor Club, with headquarters in Red Lion, Pa. The officers are: President, Jacob T. Grim, Dallastown; first vice-president, C. T. Grove, Felton; second vice-president, S. C. Shaw, Dallastown; secretary, W. L. Herbert, Red Lion; treasurer, Calvin O. Lamotte, Red Lion.

K. C. Club Housewarming—The Automobile Club of Kansas City, Mo., will hold within the next 2 weeks a formal opening of its remodeled clubhouse at its country headquarters. The house has received the addition of a second story, the chief feature of which is a large ballroom, where private parties may be held.

Overland Collegians Form Club—The Overland University Club, Toledo, O., was organized recently with a membership of 200. The members are college men employed in the Willys-Overland plant. Nineteen universities were represented. The object is to bring the Overland's college men into closer relationship. All college graduates are eligible to membership. Men from twenty different departments were at the meeting. H. S. Bennett, a Michigan university man, was elected president; Rex Haines, Princeton graduate, is secretary, and George D.

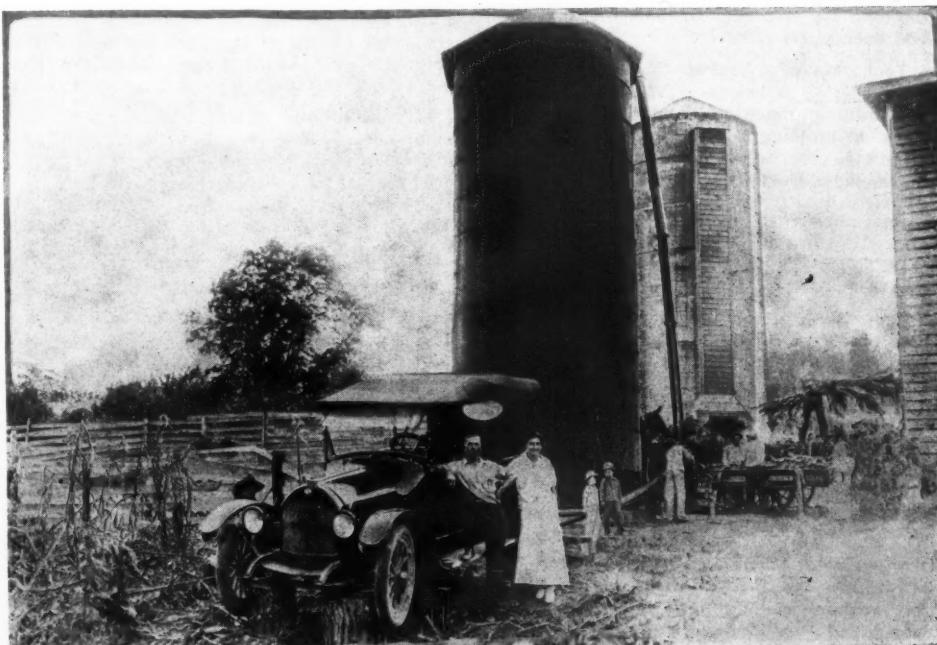
Kelly, graduate of a Catholic university, is treasurer. Committees on organization, publicity and entertainment were appointed.

Columbus Club Tells of Traps—The Columbus Automobile Club, Columbus, O., has notified its members of a number of speed traps in the vicinity of the Buckeye state capital. The members are also given instructions as to what procedure they are to follow in case they are arrested for speeding by the country officers. Under the law of Ohio the J. P. can only bind the accused over to a higher court, except when a waiver is signed by the accused.

Missouri State Club Organization Planned—A state organization of motor clubs in Missouri probably will be formed September 30 at the Missouri State Fair, which will be motor car day there. S. E. Pettis, secretary of the Automobile Club of Pettis county, in which Sedalia is located, is planning the organization meeting, and pointing out the necessity of a broad organization to help direct the spending of the million-dollar fund from licenses fees.

Columbus Associations Unified—The organization of the Columbus Automobile Trade Association, consisting of garage owners, repair men and dealers in Columbus, O., was completed at a meeting held at the Chamber of Commerce last week. In all fifty-seven members, who are stockholders in the former dealers' organization, were present. The new organization is a merger of two previous associations.

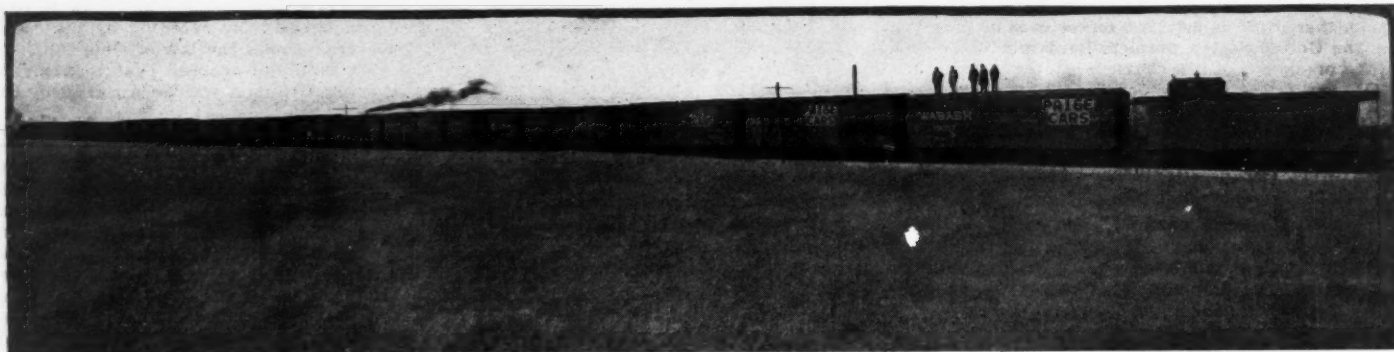
Warren, O., Club Formed—The Warren Automobile Club, Warren, O., was organized at a meeting held recently, when more than two score of motorists pledged themselves to the purposes of the organization. The organization was assisted by Fred H. Caley, secretary of the Cleveland Automobile Club. Officers were elected as follows: Frank F. Bentley, president; Curtis L. Bailey, vice-president; John X. Wadsworth, C. C. Chryst, Elmer A. Osborne, Frank Elliott and Charles Clark, member of the board of directors. A secretary-treasurer is to be elected soon.



NOVEL FARM DEMONSTRATION—Here is an unusual demonstration of an Overland model 75-B which resulted in the sale of a car. But this sale was recorded somewhat differently. The Overland dealer at Piedmont, Mo., called upon a prospect who lived 45 miles away. On reaching his farm he found him busy cutting corn and fodder for his silo. The farmer absolutely refused to talk car. The cutter and feeder were hooked to the rear wheels of the model 75-B which was jacked up and placed on stumps as shown in the illustration.



Among the Makers and Dealers



SOLID TRAIN LOADS OF PAIGES—Enough orders have already been filed at the factory of the Paige-Detroit Motor Car Co. to assure the smashing of the September sales record as completely as the record for August was broken, when more than \$2,000,000 worth of cars were sold and delivered. Evidence of this

popularity is found in several huge orders that have recently come in. For example, Milwaukee recently wired for a solid train load of Paige cars. Before the week was over the long train was made up and sent on its way to Wisconsin. This method of wholesale shipment is becoming common.

RYAN Leather Moves—The Ryan Leather Co. has moved from its former location in Newark, N. J., where a short time ago its factory was partially destroyed by fire, to its new factory just completed in Irvington, N. J.

Crow Motor Changes Name—The Crow Motor Car Co., Elkhart, Ind., was granted permission by court order last week to change its name to the Crow-Elkhart Motor Co. The name of the car manufactured by the company recently was changed to the Crow-Elkhart.

Bulldog Shock Absorbers to Plymouth—Adelbert Work, Chicago, head of a company manufacturing Bulldog shock absorbers and other accessories, has announced plans for removing the plant from Chicago to Plymouth, Ind., as soon as a factory building can be erected. Ground for the plant has been purchased.

Tool Maker Adding—The Kearney & Trecker Co., Milwaukee, Wis., manufacturing milling machines and other machine tools, is building a new smithing shop and otherwise increasing its capacity. The demand from the motor car industry is particularly heavy and the company is 60 days behind on orders. In fact, the output is sold up to May 1, and on some lines up to July 1, 1917, and all of it is for domestic consumption.

Pete Willis Joins Singleton—P. P. Willis has joined the Singleton-Hunting Co., Cleveland, O., as vice-president and manager of production. Mr. Willis has been advertising manager for Overland, and later for 5 years in a similar capacity for National, and during the last 3 years in the agency field handled the National, Auburn, Lexington-Howard and other motor car accounts. James P. Hunting became treasurer and continues in charge of merchandising.

Milwaukee Machinists' Strike Over—The Milwaukee machinists' strike for an 8-hour day without reduction in the wage, which was called July 18 and for a short time seriously affected about forty big industries, including motor and truck manufacturers, is practically over. More than 80 per cent of the strikers have returned to work, and in no instance has the 8-hour day or any other concession been granted. The men are being taken back on the basis of a 52½-hour weekly working schedule, which was voluntarily offered by the employers on July 1.

The open shop principle has not been prejudiced by the strike, as the employers consistently refused to treat with the strikers as union members and are taking the men back as individuals only.

Another Akron Rubber Concern—Another name in the rubber industry of Akron, O., is indicated by granting of a permit to erect buildings to cost \$100,000 to the American Hard Rubber Co. Five one-story buildings will be included in the plans. The new plants will be erected on a large tract of land the company purchased in Springfield township. More buildings may follow.

Star Rubber Reorganized—Reorganization of the Star Rubber Co., Akron, O., has taken place, along with an increase in capitalization from \$200,000 to \$400,000. L. H. Firey, Kansas City, brother-in-law of F. A. Seiberling, Goodyear head, will be president and treasurer of the reorganized company. The company will expand and enter the tire manufacturing field.

Haynes to Add Again—The Haynes Automobile Co., Kokomo, Ind., will build an extension to its present office building 116 by 100 feet. Two lots were purchased last week to make the extension possible. Although the office building was constructed only recently it has been found that additional space is required. Work will be started at once.

Chevrolet Plant at Fort Worth—Work will begin within a few weeks on the Chevrolet Motor Co.'s plant at Fort Worth, Tex. The plant will be one of the most complete assembling plants in the southwest. Last week the Chevrolet Motor Co. of Texas was chartered with a capital stock of \$600,000. The incorporators were: W. C. Stripling, Sam Davidson and B. C. Bradford of Fort Worth and W. C. Durant of New York. The Chevrolet Motor Car Co. of Dallas has been dissolved. The work will now be centered on the Fort Worth plant.

Moline Tractor Building Nearly Complete—The Moline Plow Co., Moline, Ill., will complete a new addition to the plant about November 1, which will give employment to 600 men. The addition will be devoted exclusively to the manufacture of farm tractors. The principal building now under construction will be 100 feet by 785 feet. Another building 180 by 360 feet will be used as a foundry and for housing the metal parts. The company is far behind in its

orders for tractors and the expansion is imperative.

Williams Leaves Gibson Co.—R. Williams has resigned as accessory sales manager of the Gibson Co., Indianapolis, Ind., to become vice-president and general manager of the Chanslor & Lyon Co., San Francisco, Cal., accessory dealer and distributor. He will be succeeded by E. C. Kurman, manager of the Gibson Co.'s branch at Logansport, Ind. Mr. Williams will depart for San Francisco in a few days. He has been connected with the company for 4 years.

Advance Felt Moves Again—The Advance Felt Specialty and Cutting Co., Chicago, have moved into its new quarters at 318-322 South Jefferson street. This is the second move for the company within the last 18 months due entirely to the rapid growth of the business. The new building is of the daylight type, two stories with full concrete basement, brick construction with sprinkler system, equipped throughout with specially designed machinery for the cutting, striping, and punching of felt cloth, rubber, and analogous materials.

Heider Tractor Plant Under Way—Work began this week on the new building of the Rock Island Plow Co., Rock Island, Ill., to be used as an assembling plant for the Heider tractor. Parts for the tractor are manufactured in the general plant of the plow company and will be put together in the new structure and which will cover a city block, eight houses being removed to make room for the addition. Only steel and concrete will be used in the construction.

Toledo Studebaker Contract \$12,000,000—The newly organized Studebaker Sales Co., Toledo, O., has closed a contract for \$12,000,000 worth of Studebakers for distribution in their territory of Ohio and parts of five adjoining states. The company was formed with a capital of \$500,000 through the consolidation of the Blevins Auto Sales Co., of Toledo and Cincinnati; the A. R. Davis Motor Co., of Cleveland, and J. O. Hahn, of Toledo, who had territory in Ohio.

Change in Paige-Toledo Co.—C. L. Sturtevant, president and general manager of the Paige-Toledo Co., Toledo, O., has purchased the interest in that company owned by H. D. Davis, secretary and treasurer. The Paige-Toledo Co. was organized 2 years ago by C. L. Sturtevant, H. D. Davis and others. One year ago the two men purchased practically all the outstanding stock in the company and Davis, who had been a silent

partner, joined the company actively later. C. L. Sturtevant, who now owns the bulk of the stock, will conduct the business as heretofore. The company controls the distribution of Paige and Marmon cars in northern Ohio and southern Michigan.

Hudson Building Service Station—The Hudson Motor Car Co., of New York, Inc., is building a service station, 203x259, four stories, between West Sixty-eighth and Sixty-ninth streets and the North river.

Hoerger at Boston Goodyear—O. E. Hoerger, St. Louis, Mo., recently assistant to Wilson C. Dodd, manager of the Goodyear branch, has been promoted to operating manager of the Goodyear branch in Boston.

Keating Wins Contest—Joseph Keating, of the Studebaker branch in Brooklyn, N. Y., has won the 1,000-point contest for the branch and is spending the week at the Studebaker factory at the expense of the company.

French Manages Danville Packard—D. E. French, Danville, Ill., has been placed in charge of the newly established branch of the Packard Motor Car Co., in that city, and will have charge of the distribution for ten counties of eastern Illinois.

Parker Gets Factory Site—The Parker Rust Proof Co., Detroit, Mich., which will manufacture a rust-proof liquid used on motor cars, has purchased a site on Conant road, in Hamtramck for a factory, work on which has already been started. It is stated that 700 men will be employed in the plant.

Rosenberg M. & S. Engineer—R. H. Rosenberg, formerly with the Universal Machine Co., Bowling Green, O., has resigned to accept the position of chief engineer with the M. & S. Gear Co., Detroit, Mich. The plant of this company is to be enlarged immediately for the production of 300 differentials daily.

Gramm-Bernstein Stock Increased—The Gramm-Bernstein Truck Co., Lima, O., has been underwritten by a firm of New York bankers with a capital stock of \$4,000,000, \$1,000,000 being preferred. Max Bernstein, president, and B. A. Gramm, general manager, remain active. The company has had some profitable war orders.

Hubbard Is Harris Vice-President—Franklin G. Hubbard has resigned as chief engineer of the mechanical department of the Western Electric Co. plant in Hawthorne, Ill., to become vice-president, a stock holder and director of the H. E. Harris Engineering Co., Bridgeport, Conn. The Harris company, in addition to the engineering business connection.

Imperial Brass to Double Plant—The Imperial Brass Mfg. Co., Chicago, soon will begin construction of an addition to its factory which will double its floor space. The present building contains 75,000 square feet, and the addition will contain an equal area, giving a total of 150,000 square feet. The new foundry will more than double the present foundry space.

Barnard Heads Harvey Spring Sales—Paul J. Barnard, Minneapolis, Minn., has been made sales manager of the Harvey Spring and Forging Co., Racine Junction, Wis. Mr. Barnard was with the Gas Traction Co., Minneapolis, and Emerson-Brantingham Co., Rockford, Ill., for 6 years. Following that he was in business for himself as northwestern distributor for the Burd piston rings and Harvey boltless auto springs.

Skinner Manufacturers' Representative—Kenneth Skinner has resigned as secretary of the Micro Piston Ring Co., New York, having sold his interest in the concern. Mr. Skinner has gone into business as a manufacturers' representative under the firm name Auto Appliance Co., 1960 Broadway, where

he represents the G. H. Dyer Co., Cambridge, Mass., and the Asbestos & Rubber Works of New Jersey, Camden, N. J.

Maxwell Branch at Winnipeg—The Maxwell Motor Car Co. has selected a site for a factory branch in Winnipeg, Man.

Brown Completes Treating Plant—The Brown Co., Syracuse, N. Y., has just completed its new heat treating department. The new building is of fireproof brick and steel construction.

Haring Vim Traffic Manager—W. C. Haring, formerly freight and passenger solicitor of the Chicago, Burlington & Quincy railroad, has been made traffic manager of the Vim Motor Truck Co., Philadelphia, Pa.

Torbensen Axle Official Personnel—The Torbensen Axle Company, Cleveland, O., has elected officers as follows: President, V. V. Torbensen; vice-president, W. J. Baxter; treasurer, J. O. Eaton; secretary, A. H. Ide.

Finney Goes to Factory—W. E. Finney, St. Louis, Mo., recently manager of the Goodyear Tire and Rubber branch in that city, has been assigned to the mechanical goods department at the Goodyear factory at Akron, O.

Hatch Moves Up—Charles Hatch, sales representative of the Perfection Spring Co., Cleveland, O., for the last 8 years, has been promoted to the position of sales manager of the company and appointed a member of the executive committee.

Woodruff With Simplex—The Simplex Automobile Co. has appointed A. A. Woodruff assistant sales manager with offices at 60 Broadway, New York. Mr. Woodruff will have charge of office routine and system, and the spare and repair parts business. He will also remain manager of the body department.

Houghton Production Schedule—The Houghton Motor Co., Marion, O., will build 500 ambulances and hearses during the coming year. Fifty of the vehicles are to be delivered by January 1, 1917, and all are to be delivered by October 1, 1917. The concern has been devoting the last year on experimental work.

Branch Supervisor for Gibson—The Gibson Co., Indianapolis, Ind., Indiana Overland distributor, has appointed P. J. Ryan as supervisor of its six branches. He has been identified with the Gibson company for many years. He will have charge of branches and

branch managers at Muncie, Lafayette, Logansport, Vincennes and Danville.

Stutz Earnings—The Stutz Motor Car Co., Indianapolis, Ind., during the 5 months ended May 31, 1916, earned \$1,319,107.

Albach Goes to White—Clarence Albach, St. Louis, Mo., who has been selling truck tires in that territory for Firestone and Gibney companies, has joined the White Co. force to sell trucks.

Saxon Profits—During the 5 months ended May 31, 1916, the Saxon Motor Car Corp., Detroit, Mich., made a profit of \$707,907. Its sales were \$6,680,008.

Stanley McQuay-Norris Branch Manager—Frank J. Stanley, who has been traveling on the Pacific coast for the McQuay-Norris Mfg. Co., has been transferred to Cincinnati, O., as manager of the branch there.

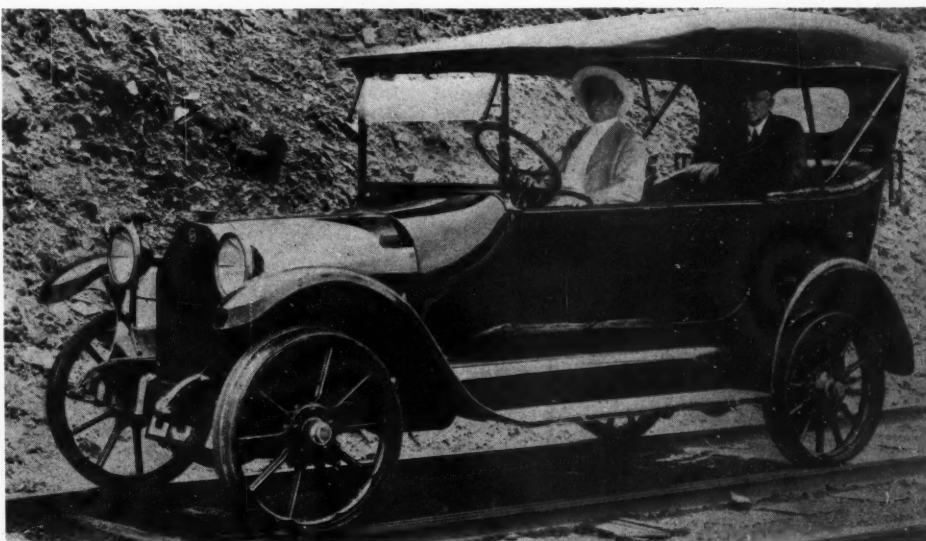
Vellie Representative in Australia—The Vellie Motor Vehicle Co., Moline, Ill., has closed with Andrew Robertson, representing Clutterbuck Bros., Sydney, Australia, for representation of the Vellie line in that country.

Overland to Erect Service Building—The Willys-Overland Co. has leased a site 150 by 130 at St. Marks and Underhill avenues, Brooklyn, N. Y., on which it will erect a service station. The rental for a period of years is \$100,000.

Maxwell Assembly Plant for Dallas—The Maxwell Motor Car Co., has purchased a site for an assembling plant in Dallas, Tex. Details will not be made known for several days. The plant will be the distributing point for five states and a plant costing several hundred thousand dollars will be erected.

Githens Selling Motor Securities—Walter L. Githens, who headed the Chicago Maxwell agency here prior to July 1, when it was made a branch, has opened offices in the Boreland building for the handling of motor securities. Associated with him is his brother, and the firm name is the Githens Bros. Co.

Bosch Building Another Addition—The recent addition to the extensive Springfield, Mass., works of the Bosch Magneto Co. is to be further augmented by a large addition providing more than 60,000 additional square feet. Ground has already been broken for the new building and its completion will be



THE PRESIDENT'S CAR—A Studebaker Four, owned by the Maryland & Pennsylvania Railroad, is used by President O. H. Nance and other officials as an inspection car. A set of special flanged rims have been substituted for the regular demountables, so that the car can be run on

steel rails. The Studebaker averages a speed of 40 miles an hour and operates on regular railroad schedule. It makes 22 miles per gallon of gasoline. President Nance is at the wheel, and M. E. Sebree, superintendent of the road, is in the rear seat. The car is in almost daily use.

rushed. The addition is to be a single story building for fine manufacturing and consequently is to have a saw-tooth type of roof, providing the maximum of light and ventilation.

Goodyear Installs Cooling Battery—To provide for the constant flow of electric power and at the same time conserve the water supply which rotates the great turbine at the plant of the Goodyear Tire and Rubber Co., Akron, O., the company is erecting a battery of five cooling towers, the first to be installed by any of the large rubber companies of the country. The cooling battery is being installed in five sections, each equipped with a 12-foot rotary fan. These create a current of cold air through which

the overheated water coming from the turbine may splash and re-enter the turbine at the proper temperature. In this manner 12,500 gallons of water may be cooled each minute and used over again indefinitely. It is estimated that in a year the water wastage will amount to less than 5 per cent.

Myers to Fageol Motors—Cornelius T. Myers, who formerly was mechanical engineer of the General Motors Co., and who lately relinquished the position of manager of the Timken-David Brown Co., has been retained as consulting engineer by the Fageol Motors Co., of California.

Accessory Men to Show—The Motor Accessory Trade Association, St. Louis, Mo., de-

cided at the September meeting last week to participate in the open week the first week in October as planned by the Automobile Manufacturers' and Dealers' Association. Dealers not on Locust street will be provided with show space in the stores of the Locust street dealers, as the car dealers are doing. All stores will be decorated, and keep open until 10:30 p. m., and display uniform signs.

Loewe B-B-C G. M.—F. J. Loewe has been appointed general manager of the Brunswick-Balke-Collender Co., Muskegon, Mich., billiard and bowling alley fixture maker, which entered the tire manufacturing field last April. For the benefit of its workmen the company has started construction work on a large number of double houses.

Recent Incorporations

Akron, O.—Denmead Rubber Co.; to manufacture rubber articles; capital stock, \$5,000; incorporators, John W. Denmead, E. H. Boylan, Perry Denmead, L. J. Oswald, and Wm. J. Hottenstein.

Albany, N. Y.—Flato Co.; motor cars, motor vehicles, garages, etc.; capital stock, \$200,000; incorporators, J. H. Roach, C. Hopton, I. Flato.

Albany, N. Y.—Emay Motor Car Co.; motors, engines, cars, tires, etc.; capital stock, \$5,000; incorporators, A. B. Reed, A. Birubbaum, N. Beaumont, Tex.—Overland Beaumont Co., capital stock, \$6,000; incorporators, H. M. Smith, R. P. Smith and Albert Perkins.

Bellefonte, Pa.—Keystone Auto Supply Co.; capital stock, \$1,000,000.

Boston, Mass.—Hinchcliffe Motor Co.; capital stock, \$100,000; incorporators, F. A. Hinchcliffe, E. T. Roache.

Buffalo, N. Y.—Packard Buffalo Motor Co.; capital stock, \$75,000; incorporators, L. R. Davidson, E. C. Suttin, B. C. Day, L. M. Bass and W. M. Wilkins.

Chicago, Ill.—Alliance Garage Co., capital \$2,400; incorporators, Wm. M. Booth, Stuart B. Krohm, R. J. Nordhold.

Columbus, O.—Eigensee and Douglas Co.; to do a general motor car business; capital stock, \$5,000; incorporators, Levi E. Douglas, Frank B. Douglass, J. W. Eigensee and Horace S. Kerr.

Cincinnati, O.—Helsey-Robbins Co.; motor car accessories; capital stock, \$15,000; incorporators, S. A. Headley.

Cincinnati, O.—Anderson Steam Vulcanizer Co.; capital stock \$100,000; to manufacture steam vulcanizers; incorporators, Edward D. Woodward, Newton M. Anderson, William D. Schwartz, Eugene Schmidt and James C. Wells.

Cincinnati, O.—Star Motor Co.; to sell motor cars and supplies; capital stock, \$200,000; incorporators, Louis Tyroler, David W. Rudisell, G. Usher, Arthur W. Fischer and Milton Cayce.

Cincinnati, O.—Cincinnati Storage Battery Co.; capital stock, \$30,000; to deal in storage batteries; incorporators, Albert H. Luhrman, William T. Polery, Edna McDonald, H. L. Gordon and Michael G. Heintz.

Cleveland, O.—The Big Four Tire & Rubber Co.; capital stock, \$10,000; incorporators, A. M. Snyder, D. H. Tilden, Horatio Ford, W. J. Budd, G. M. Reilly.

Cleveland, O.—F. & F. Tire & Supply Co.; to deal in tires and motor car supplies; capital stock, \$10,000; incorporators, D. Gobille, Frank L. Fickel, Ella Fickel, Anthony Fickel and Fred A. Fickel.

Cleveland, O.—Adams Motor Car Co.; to deal in motor cars; capital stock, \$10,000; incorporators, John H. Smart, W. W. Watkins, Wm. T. Bishop, A. L. Lawrence, and Carl B. Ford.

Cleveland, O.—Mathematical Wheel Co.; to manufacture wheels; capital stock, \$10,000; incorporators, Harry H. King, Victor C. Lynch, Eliad King, M. O. King and Mrs. M. O. King.

Cleveland, O.—Woodruff Motor Co.; to sell motor cars and supplies; capital stock, \$25,000; incorporators, W. R. Godfrey, D. P. Mills, P. S. Knight, L. Dreher and M. Marquark.

Cleveland, O.—Hess-Strayer Auto Service, capital stock, \$10,000; to do a garage and repair business; Harry Hess, H. J. Strayer, C. D. Hess, H. P. Strayer and T. D. Lamb.

Cleveland, O.—DeNoon Sales Co., capital stock, \$5,000; to deal in motor car accessories; I. N. DeNoon, Fred S. Jones, N. D. Sample, W. J. Striebing and L. M. Knoll.

Cleveland, O.—Bottenfield Tire Co., capital stock, \$400,000; to sell tires; Sidney T. Bottenfield, E. J. Speck, C. A. Myers, A. D. Howe and J. B. Kanner.

Columbus, O.—McClure Tire & Rubber Co.; capital stock, \$15,000; to sell tires; incorporators, Robert T. McClure, James A. McClure, Edwin Buchanan, Joseph P. Eagleson and Arthur M. Howson.

Dallas, Tex.—Randal Adams Co., capital stock, \$10,000; incorporators, H. M. Randal, H. O. Adams and Mrs. Bama Adams.

Dallas, Tex.—Universal Ford Sales Co.; capital stock, \$10,000; incorporators, John P. King, Brown Harwood and Dean W. Reader.

Dayton, O.—Coffield Tire Protector Co.; capital stock, \$50,000; to manufacture tire protectors; incorporators, Peter T. Coffield, John T. Rose, George B. McCann, W. F. Stark and Benj. F. McCann.

Dayton, O.—Consolidated Automobile Co.; to sell motor cars and supplies; capital stock, \$20,000; incorporators, W. C. Littleton, F. R. Vainman, A. R. Shropshire, Geo. A. Stultz and Edward E. Duncan.

Dayton, O.—Baggott-Strickler Motor Car Co.; to sell motor cars and supplies; capital stock, \$25,000; incorporators, John A. Baggott, W. T. Strickler, Clifford E. Strickler, Robert C. Patterson and Joseph Murphy.

Dayton, O.—Quartz Spark Plug Co.; to manufacture spark plugs; capital stock, \$25,000; incorporators, B. F. Weaver, Isaac Warner, I. I. Haure, George S. Lott.

Dayton, O.—Dayton Steel Wheel Co., capital stock, \$50,000; to manufacture motor car wheels; incorporators, George Walther, Jacob Walther, Katie Walther, W. A. Pierce and G. E. Nicholas.

Detroit, Mich.—New Era Spring & Specialty Co.; capital stock, \$50,000; incorporators, William S. Daniels, Ethel F. Fulmer, William B. Blood.

Dover, Del.—Crowthers Motors Corp., capital stock, \$5,000; to manufacture motor cars and their parts. F. R. Hansell, George H. B. Martin and S. S. Semour.

Dubuque, Ia.—Overland-Dubuque Co.; Overland and Willys-Knight agency; capital stock, \$10,000; incorporators, John J. Hazel, C. R. Spencer.

Elyria, O.—Elyria Auto Co.; capital stock, \$10,000; to operate a garage; incorporators, M. J. Lepper, C. A. Wise, W. A. Rudy, R. F. Vandemark and K. L. Sage.

East Orange, N. J.—National Motor Service; capital stock, \$50,000; operate taxicabs and engage in general transportation; incorporators, Harry H. Picking, Felix R. Smith, Gordon Grand.

El Paso, Tex.—El Paso Auto Sales Co.; capital stock, \$15,000; incorporators, C. R. Johnson, E. C. Allen and W. V. Davis.

Evansville, Ind.—Schlundt Motor Co.; capital stock, \$25,000; incorporators, Jabez Woolley, C. A. Reitz, A. J. Schlundt.

Fort Wayne, Ind.—Steinhart-Randall Auto Co.; to buy and sell motor cars; capital stock, \$12,000; incorporators, A. L. Randall, G. H. Grieger, E. W. Steinhart.

Fl. Wayne, Ind.—Anthony Auto Lifter Company; capital stock, \$10,000; machinery; incorporators, C. O. Rice, W. O. Chaney, G. F. Seymour.

Fort Worth, Tex.—Chevrolet Motor Co., capital stock, \$600,000; incorporators, W. C. Stripling, Sam Davidson, B. C. Bradford and W. C. Durant.

Gatesville, Tex.—Maxwell & Gilliam Auto Sales Co.; capital stock, \$12,000; incorporators, P. L. Maxwell, A. G. Gilliam and D. D. McCoy.

Grand Rapids, Mich.—Western Michigan Paige Co.; capital stock, \$10,000; to deal in motor cars; incorporators, J. B. & C. L. Conger and H. L. Porter.

Jackson, Mich.—S. & W. Detachable Body Co.; capital stock, \$10,000; to make detachable bodies; incorporators, F. C. Badgley, Israel Mendelson and John A. McAvoy.

Jacksonville, Tex.—City Garage and Automobile Co.; capital stock, \$5,000; incorporators, F. L. Haberie, Sam D. Goodson and C. B. Newsom.

Lakewood, O.—Riverside Taxicab Co., capital stock, \$1,000; to do a taxicab business; W. Hanushek, S. J. Friedman, Frank L. Miller, R. Bigham and E. C. Warner.

Lima, O.—Lima Cadillac Co.; to sell motor cars and supplies; capital stock, \$20,000; incorporators, R. A. Kerr, O. C. Plummer, C. A. Bower, E. L. Kirk and Amos Pearson.

Lima, O.—Gramm-Bernstein Motor Truck Co.; capital stock, \$4,000,000; incorporators, B. A. Gramm, Max Bernstein, Dudley Bernstein, S. S. Wheeler, H. O. Bentley.

Louisville, Ky.—Leyman Motor Co.; capital stock, \$10,000; incorporators, H. E. Layman, H. D. Compton and Clarence Longacre.

McAlester, Okla.—McAlester Auto & Supply Co., capital stock, \$5,000; incorporators, William Redpath, Elmo King and M. S. Jordan.

Minneapolis, Minn.—Martins Taxi Service, Inc., taxicab motor cars; capital stock, \$10,000. J. W. Robertson, O. J. Smith and F. A. Duff.

Minneapolis, Minn.—La Crosse Auto Co.; capi-

tal stock, \$60,000; incorporators, A. Hirschheimer, B. F. Hamey and B. R. Kelly.

Midland, Tex.—Western Auto Co.; capital stock, \$10,000; incorporators, K. E. Nutt, C. W. Kerr and Allen Tolbert.

Midland, Tex.—Bogg Puncture-Proof Tube Co., capital stock, \$10,000; incorporators, George D. Elliott, William W. Wallace and B. C. Girdley.

New York—Keystone Auto Supply Co.; capital stock, \$1,000,000; manufacture of motor car supplies of all kinds; incorporators, Ellis L. Orvis, H. S. Laylor, H. W. Smith.

New York—U. S. Safety First Motor Signal Co.; to manufacture safety first motor signals and other novelties; capital stock, \$75,000.

New York—S. V. M. Sales Corp.; to manufacture motors, engines, machinery, devices, etc.; capital stock, \$600,000; incorporators, F. Ducas, E. F. Gates, E. L. Russell.

Pittsburgh, Pa.—American Automobile Service Co.; capital stock, \$10,000; incorporators, David S. Ackerman, Benjamin S. Boswick, Joseph Reichman.

Philadelphia, Pa.—Alliance Tire & Rubber Co., to manufacture motor cars and supplies; capital, \$2,500; incorporators, William F. O. Keefe, George G. Speigler, E. E. Wright.

Philadelphia, Pa.—Cuban Motor Spirits Co.; capital stock, \$1,000,000; to acquire machinery for condensing and fractionating gases into motor spirits; incorporators, Herbert E. Latter, C. L. Rimlinger, M. V. Haywood.

Pierre, S. D.—Midwest Auto Co.; capital stock, \$10,000; incorporators, Bernard McCallag, Winifred Ewert and Theodore Sheehan.

Port Arthur, Tex.—Overland Port Arthur Co., capital stock, \$6,000; incorporators, Albert Perkins, H. M. Smith and R. P. Smith.

Port Arthur, Tex.—Overland-Smith Co., capital stock, \$6,000; incorporators, R. P. Smith, H. M. Smith and Albert Perkins.

Port Arthur, Tex.—Port Arthur Tire Co., capital stock, \$2,000; incorporators, A. F. Hughes, J. R. Campbell and C. M. Disnakes.

Richmond, Va.—Richmond Motor Co.; capital stock, \$15,000; incorporators, S. G. Proffit, H. L. Lawson.

Saginaw, Mich.—The Saginaw Co-operative Auto Supply and Enameling Co.; capital stock, \$20,000; incorporators, Earle Lyman Rullison, J. L. Marker, George B. Miller, William H. Roberts and Albert C. Klopff.

San Marcos, Tex.—Lindsey Transfer Co., capital stock, \$31,000; incorporators, J. L. Lindsey, Clinton Lindsey and F. W. Lindsey.

Sour Lake, Tex.—Hardy County Garage & Supply Co., capital stock, \$10,000; incorporators, R. F. Theis, G. W. Swain and F. H. Carpenter.

Sour Lake, Tex.—Hardin County Garage, capital stock, \$4,000; incorporators, R. F. Theis, G. W. Swain and F. Carpenter.

St. Louis, Mo.—Columbia Auto Sales Co., capital stock, \$10,000; incorporators, Joseph Posen, Joseph Gilliam, Clarence A. Prichardt.

St. Louis, Mo.—Superior Tire & Supply Co.; to do general tire and accessories business; capital stock, \$2,000; incorporators, V. H. Handschug, E. A. Handschug, Earl Handschug, T. C. Detzer.

St. Louis, Mo.—Auto Device Co.; capital stock, \$27,500; Charles W. Price, R. L. MacDonald, Louis F. Abel, Fred Abel and Margaret Olsen.

St. Louis, Mo.—Tevis Motor Co.; capital stock, \$5,000; incorporators, L. G. Tevis, Eugene J. Maunel.

St. Louis, Mo.—Ayres Auto Co.; capital stock, \$5,000; incorporators, C. E. Ayres, Samuel Bredon.

Springfield, Ill.—Springfield Tire Service Co.; capital stock, \$5,000; incorporators, Edward C. Mitts, Philip Stewart, L. L. Bingham.

Springfield, O.—Springfield Motor Car Co.; capital stock, \$10,000; incorporators, C. W. McGilvray, H. G. Wiley, William E. Hoffman, C. L. Gallagher, George S. Raup.

Texarkana, Tex.—Texarkana Auto Supply Co.; capital stock, \$10,000; incorporators, C. E. Palmer, J. C. Hughes and F. McElreath.

Tallahassee, Fla.—J. R. Holland Automobile Co.; to deal in motor cars and machinery, garage, etc.; capital stock, \$25,000; incorporators, J. R. Holland, J. W. Martin, Fred T. Field.

Washington, C. H. O.—Ortman Motor Co.; capital stock, \$25,000; to operate a garage; incorporators, H. B. Dahl, D. S. Craig, W. M. Campbell, P. F. Ortman and M. E. Hitchcock.

Warren, O.—Fahrney & Williams Motor Co.; to sell motor cars and supplies; capital stock, \$10,000; incorporators, F. D. Williams, Ira S. P. Fahrney, Sara Williams, W. M. Kayser and S. C. Graber.